

A PROPOSAL TO REDUCE AIR POLLUTION IN CHINA BY SUBSIDIZING THE
ENERGY INDUSTRY

by
Kangyi Shao

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Abstract

With the rapid growth of China's economy, the extensive economic development model has caused massive pollution to China's air and environment. If we do not change the current economic development model and adjust the energy structure, the destruction of the natural environment will affect people's quality of life. And the economic operation will not be sustainable. China is at the end of industrialization and the middle of urbanization, and industrialization will inevitably be accompanied by greenhouse gas and pollution emissions. In recent years China has made efforts to improve energy productivity by improving energy efficiency and developing renewable energy sources, but due to its rapid economic growth, China is now highly dependent on fossil energy for its energy supply. China is the world's largest producer of renewable energy, but it is also the world's largest importer of fossil energy. If China maintains its current energy policy, it will have a serious impact on the country's air and environment. Therefore, this proposal will focus on how to solve the current air pollution problem in China by restructuring the energy mix and provide concrete solutions to support the development of renewable energy in China.

Keywords: Air pollution, greenhouse gas emissions, energy structure, renewable energy

Capstone Advisor: Professor Paul J. Weinstein,

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Subject: proposal to subsidize the energy industry

Action-Forcing event

Air pollution is the fifth-ranking risk factor for death globally and the fourth-ranking risk factor for death in China. In 2017, the number of deaths caused by air pollution in China exceeded 1.2 million, and the number of deaths caused by air pollution has accounted for 10% to 15% of the total number of deaths¹. In the past few years, Beijing has been trying to reduce air pollution concentration across the country. President Xi Jinping also recently stressed the need to continuously improve China's ecological environment at the 19th Congress of the Communist Party of China.

Statement of the problem

With the rapid growth of China's economy, China's energy consumption is increasing rapidly. However, the air pollution caused by the excessive use of coal for power generation has had a serious impact on the health of the Chinese people, and it has also caused huge losses to the Chinese economy. In China, due to air pollution, an average of about 350,000 premature deaths and 760,000 cases of child asthma will be caused every year.²

¹ Jingdong Wang, Air pollution is the fourth leading cause of death in China, Dec 29, 2019, <http://news.cctv.com/2019/12/29/ARTIWGclFfKjmABH8tc9Wjp3191229.shtml>

² Lauri Myllyvirta, Air Pollution in China 2019, CREA, Jun 2020,

Many domestic and foreign research reports on China's air pollution have pointed out that air pollution has a fatal impact and has a wide range of effects in China. From a national perspective, the death toll caused by air pollution has exceeded the death toll caused by earthquakes and floods. According to a recent study in the medical journal *The Lancet*, an estimated 1.24 million people died from exposure to air pollution in the PRC in 2017. Since 2000, the number of people who have died from air pollution in the PRC has risen to 30 million, according to *New Scientist* magazine.³ In 2017, a study of mortality in the area north of the Huai River found that the content of air pollutants in the area north of the Huai River due to coal-burning has increased significantly, and the average life expectancy of the public has been shortened by 3.1 years.⁴ Research in China has also reached similar results. A 2014 study by Tsinghua University and Peking University showed that in 2012, the number of deaths caused by air pollution from coal consumption was approximately 670,000. Among them, about 355,000 are distributed in the North China Plain, which has serious air pollution. The author of the report also pointed out that the number of people suffering from chronic diseases due to air pollution has increased significantly.⁵

The concentration of particulate matter in China has far exceeded the level recommended by the WHO. The World Health Organization's air quality guidelines recommend that the annual average PM_{2.5} (particulate matter below 2.5 microns in diameter) in a country should not exceed 10 micrograms per cubic meter, and the annual average PM₁₀ per cubic

<https://energyandcleanair.org/wp/wp-content/uploads/2020/01/CREA-brief-China2019.pdf>

³ ShareAmerica, China's air pollution harms its citizens and the world, ShareAmerica, Nov 24, 2020, <https://share.america.gov/chinas-air-pollution-harms-its-citizens-world/>

⁴ Michael Greenstone, New evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River Policy, EPIC, Sep 11, 2017, <https://epic.uchicago.edu/insights/new-evidence-on-the-impact-of-sustained-exposure-to-air-pollution-on-life-expectancy-from-chinas-huai-river-policy/>

⁵ Bob O'Keefe, Tsinghua and HEI Released a New Report on the Health Burden of Air Pollution From Coal in China, School of Environment, Tsinghua University, Aug 19, 2016, <https://www.tsinghua.edu.cn/enven/info/1042/1455.htm>

meter should not exceed 20 micrograms.⁶ In the four months of mid-2014, 92% of the Chinese population was exposed to polluted air for more than 120 hours.⁷

Other effects of air pollution include declining agricultural output, business interruption, worker absenteeism, school closures, and real estate devaluation. According to a study in 2016, smog reduces the light in the North China Plain, which may reduce crops by 30%.⁸ Air pollution can also cause sickness and absenteeism of company employees, leading to a decline in company productivity. The same goes for school closures. In 2012, A study by Peking University evaluated the impact of China's air pollution on local real estate prices and found that real estate prices would fall sharply due to smog⁹.

In addition, in China, the economic costs caused by air pollution are rising. According to the "China in 2030" report released by the World Bank, the annual financial loss caused by the increase in mortality and morbidity caused by air pollution is estimated to be between 100 billion and 300 billion US dollars¹⁰. According to Peking University and Tsinghua University research, a quantitative analysis of the mortality caused by cardiovascular diseases, lung diseases, and strokes found that coal production and consumption's environmental and health costs in China are about 260 RMB per ton.¹¹

Therefore, air pollution caused by the excessive use of coal resources has become an urgent problem for China. Damage to people's health, rising medical costs, declining productivity,

⁶ World Health Organization, WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, http://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf;jsessionid=11B2C690D5D1FA280A9BB14618070EB7?sequence=1

⁷ RA Rohde, Air Pollution in China: Mapping of Concentrations and Sources, 7-14

⁸ Xiuwei Liu, Assessing the Impact of Air Pollution on Grain Yield of Winter Wheat - A Case Study in the North China Plain, PLOS ONE, Sep 9, 2016, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0162655>

⁹ Jianing Wang, The value of air quality in housing markets: A comparative study of housing sale and rental markets in China, ScienceDirect, www.sciencedirect.com/science/article/pii/S0301421521004675?dgcid=rss_sd_all

¹⁰ Yang Xie, Comparison of health and economic impacts of PM2.5 and ozone pollution in China, ScienceDirect, <https://www.sciencedirect.com/science/article/pii/S0160412019310530>

¹¹ Fei teng, "The true cost of coal", <http://www.nrdc.cn/Public/uploads/2017-01-20/58817a3ad38e1.pdf>

waste of resources, suspension of work and classes, and shrinking real estate values are the costs of air pollution, and this crisis may continue to intensify.

History/Background

"Smog" is a common term used to indicate PM_{2.5} pollution. It first appeared in a news broadcast in China in 2007. In the following years, the smog pollution spread in a large area and became a normal state. Smog appears in mainland China along the same path every year. The plains from the south of Beijing to the Yellow Sea and the Bohai Sea have become areas of the high incidence of smog. On February 29, 2012, the Ministry of Environmental Protection formally approved the release of the newly revised "Ambient Air Quality Standard", which added 8-hour concentration limit monitoring indicators for fine particulate matter (PM_{2.5}) and ozone (O₃)¹². The Ministry of Environmental Protection's definition of smog became the most significant event in 2012, and it also kicked off a protracted "battle against smog".

Coal is one of the most important causes of air pollution in China. China's economic development, industrial electricity, and household electricity are overly dependent on coal. In the early years, China's thermal power generation industry had low coal combustion efficiency due to backward technology and caused serious air pollution. Coal-using industries such as steel and cement account for about 40% of China's PM_{2.5} pollution. Although the Chinese government has implemented a series of new policies to get rid of coal energy,

¹² Dong Xu, "Probe into gaseous pollution and assessment of air quality benefit under sector dependent emission control strategies over megacities in Yangtze River Delta, China", EPA, 2013, https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/2272150

China is still the world's largest coal consumer, accounting for 60%¹³ of its total energy consumption.

In January 2013, there was continuous large-scale smog weather in mainland China. The smog covered a quarter of the land area of 17 provinces, municipalities, and autonomous regions, affecting about 600 million people. After the winter of 2013, China experienced the most severe smog pollution in history, involving almost all areas in the central and eastern regions. The air quality index of Tianjin, Hebei, Shandong, Jiangsu, Anhui, Henan, Zhejiang, Shanghai, and other places has reached the sixth serious pollution level. The daily average concentration of the primary pollutant PM_{2.5} exceeds 150 micrograms per cubic meter, and in some areas, it reaches 300 to 500 micrograms per cubic meter. Among those cities, Shanghai's pollution reached more than 600 micrograms per cubic meter on December 6, and locally to 700 micrograms per cubic meter or more. The most severe area of heavy smog pollution this time is in central and southern Jiangsu province. The air quality in Nanjing was severely polluted for five consecutive days and heavily polluted for nine days. The instantaneous concentration of PM_{2.5} at 11 o'clock in Nanjing on December 3 reached 943 micrograms per cubic meter. After the smog, the Central Meteorological Observatory stated that the average number of smog days in China this year was the highest in 52 years.¹⁴

On December 8th, 2013, large-scale smog persisted for several consecutive days, and pollution disasters such as heavy smog and heavy haze appeared. In central and southern Hebei, Tianjin, southern Shandong, eastern Henan, most parts of Jiangsu, Anhui, and northern Zhejiang, there is dense fog with visibility less than 500 meters, and some areas have intense fog with visibility less than 200 meters. Some areas in western Jiangsu,

¹³ SuLin Tan, China's carbon neutral push gathers pace as coal-fired power plants drop below 50 per cent for first time, China Macro Economy, Feb 20, 2021, <https://www.scmp.com/economy/china-economy/article/3122419/chinas-carbon-neutral-push-gathers-pace-coal-fired-power>

¹⁴ Boyang Sun, The Yangtze River Delta suffered heavy smog, China daily, Dec 13, 2013, <https://web.archive.org/web/20131216062505/http://finance.people.com.cn/n/2013/1213/c66323-23828723.html>

northern Zhejiang, eastern Anhui, southeastern Hebei, and western Shandong have severe smog. According to data from the Ministry of Environmental Protection, the air quality in 104 cities in 20 provinces in China has reached extreme pollution levels¹⁵. Affected by smog pollution, relatively serious traffic accidents occurred in Jiangsu, Zhejiang, Shanghai, Hebei, and other places. Many schools and enterprises were forced to close, highways in the north were closed in large areas, and various airports experienced delays of varying degrees. From December 5th to 6th, the Nanjing Meteorological Bureau continued to issue red warnings for air pollution, and Nanjing's primary and secondary schools and kindergartens were completely closed. At the same time, the number of outpatients in the Children's Hospital increased by one-third, and the incidence of asthmatic bronchitis, pneumonia, and respiratory infections all increased significantly¹⁶. The severe smog incident caused substantial economic losses to China's central and eastern regions and severely affected people's health in the area.

China has made progress on multiple levels of air pollution and climate change. Various laws and policies recently promulgated, for example, the newly revised "Environmental Protection Law of the People's Republic of China"¹⁷ stipulates more measures to punish illegal activities in industries that pollute the environment, and the situation in various industries has been improved as a result. Since 2012, the main developments in policy include:

¹⁵ Lirong Hu, A cold front sweeping "half of China" will ease today, sdchina, Dec 8, 2013, <https://web.archive.org/web/20131213121117/http://news.sdchina.com/show/2834485.html>

¹⁶ Xia Hua, the number of outpatient visits to children's hospitals in Nanjing rose by a third after schools were closed due to smog, Xinhua, Dec 06, 2013, https://web.archive.org/web/20131222103925/http://news.xinhuanet.com/yzyd/legal/20131206/c_118457444.htm

¹⁷ Standing Committee of the National People's Congress, Environmental Protection Law of the People's Republic of China [Revised]

China announced the Air Pollution Prevention and Control Action Plan¹⁸ in 2013, proposed PM2.5 emission reduction targets for key areas and set a more effective deadline. The plan proposed regions and provinces formulate action plans to improve air quality accordingly. The Air Pollution Prevention and Control Action Plan is a turning point in China's efforts to enhance the quality of air. The plan was promulgated by the State Council, setting targets for reducing polluting gas emissions in key areas and requiring a series of adjustments to the country's energy structure. The plan sets environmental air PM2.5 reduction targets for the following key areas: By 2017, compared with 2012 levels, the Beijing-Tianjin-Hebei region plans to reduce PM2.5 emissions by 25%, and the Yangtze River Delta region plans to reduce it by 20%, the Pearl River Delta region plans to reduce it by 15%. By 2017, Beijing should control its annual PM2.5 emissions to 60 micrograms per cubic meter. One of the potential impacts of the 2013 Action Plan is to incorporate PM2.5 indicators into the key performance indicators (KPI) of the governments of provinces, cities, and autonomous regions. According to a State Council announcement issued in April 2014¹⁹, for the performance assessment of government officials in the Beijing-Tianjin-Hebei region, in addition to traditional methods, other measures will be added. For example, in addition to achieving the goal of reducing PM2.5 emissions, it will also evaluate the specific measures taken by local government officials to reduce air pollution. These measures have ten key areas, including cleaner production, sustainable transportation, and green buildings. Some government agencies will play a role in evaluating official performance, including the Ministry of Environmental Protection, the National Development and Reform Commission, the Ministry of Finance, the Ministry of Housing and Urban-Rural Development, the National Energy Administration, and the Ministry of Industry and Information Technology. Although these newly promulgated

¹⁸ Instrumentalities of the State Council, General Office of the State Council, the Air Pollution Prevention and Control Action Plan

¹⁹ Instrumentalities of the State Council, General Office of the State Council, Notice of the General Office of the State Council on Issuing the Measures for Evaluating the Implementation of the Air Pollution Prevention and Control Action Plan (for Trial Implementation)

provincial-level measures will help reduce PM2.5 concentrations in the Beijing-Tianjin-Hebei region, Tsinghua University's model analysis shows that according to these policies, the Beijing-Tianjin-Hebei region cannot achieve air quality targets. Analysis shows that the various measures described in the Action Plan can only reduce the PM2.5 concentration in Beijing, Tianjin, and Hebei by 25.6%, 18.7%, and 14.7%, respectively. This study believes that the success of the reduction target also depends on weather conditions, and weather conditions may vary significantly from year to year. The study found that while the Beijing-Tianjin-Hebei region has reduced nitrogen oxide and sulfur dioxide emissions within three years, ammonia emissions have increased, especially in winter, which may cause air quality to deteriorate²⁰. Only by adopting more rigorous measures to strengthen the plan, the Beijing-Tianjin-Hebei region will be able to achieve the environmental air quality target.

China's 2014 revision of the Environmental Protection Law²¹ gives environmental protection agencies greater powers. This law requires key emission units to disclose emission data, increase penalties for illegal activities, and strengthen the role of non-governmental organizations in environmental governance. Compared with the past, this revision is a significant improvement. In the past, fines were often one-off, and the upper limit of the penalty was too low to deter illegal acts. The Environmental Protection Law revised in April 2014 is a significant decision made by China in strengthening environmental governance. This revision to the Environmental Protection Law has opened new ground in law enforcement, extending the right to file public interest lawsuits to non-governmental organizations and authorizing regulatory agencies to impose daily fines on pollution violations. This revision is the first update of the Environmental Protection Law since it was passed in 1989. It provides environmental protection departments at all levels, courts, and

²⁰ Qiang Zhang, Drivers of improved PM2.5 air quality in China from 2013 to 2017, PNAS, Dec 3, 2019, <https://www.pnas.org/content/116/49/24463>

²¹ Standing Committee of the National People's Congress, Environmental Protection Law of the People's Republic of China

the public with better legal tools and procedures, making air polluting companies responsible for their actions and encouraging compliance with environmental regulations. The newly revised Environmental Protection Law has increased penalties for pollution violations. Although there is no explicit minimum fine, it authorizes local environmental protection departments at all levels to continuously punish the pollution from the day of the violation. Article 59 specifies that companies that emit polluting gases can be fined daily until the illegal activities are terminated.

These policy developments are in line with the government's lead in raising public awareness of air pollution. The country's top leaders have also raised their awareness of air quality issues. For example, Premier Li Keqiang proposed to tackle environmental pollution at the opening ceremony of the National People's Congress in March 2014.

Policy Proposal

The policy aims to reduce China's annual air pollutant concentration to 10 micrograms per cubic meter and reduce greenhouse gas emissions by 90 percent by 2050. My policy proposal is as follows. The Ministry of Finance provides Chinese energy companies with special subsidies of 6 billion yuan per year to promote the development of renewable energy power generation companies and reduce greenhouse gas and air pollutant emissions from coal-fired power generation companies.

The subsidy budget is as follows:

The primary way to address air pollution and greenhouse gas emissions is to increase China's renewable energy development. So, 4 billion yuan of the subsidies will be used to support renewable energy generation companies. This includes 1.5 billion yuan for the wind power industry, 2 billion yuan for the photovoltaic industry, and 500 million yuan for the biomass

power industry. The allocation of subsidies is based on the 2020 subsidy plan for renewable energy by the Chinese Ministry of Finance²². As the cost of the wind and photovoltaic energy industry has been significantly reduced, and the cost will continue to decline in the future, the market prospect of wind and solar power generation enterprises is very promising²³. Therefore, the subsidies will mainly be used for the above two renewable energy sources. Compared with the wind and photovoltaic power industries, due to technical reasons, the biomass power generation industry is difficult to obtain raw materials, and the power generation is small²⁴, so the subsidies for biomass power generation enterprises are relatively less.

Closing existing coal-fired power plants is the most direct way to reduce air pollution and greenhouse gas emissions. So, 1 billion yuan will go to subsidies for coal-fired power plants that voluntarily withdraw from the market. This policy will provide coal-fired companies that voluntarily withdraw from the market with higher compensation than their continued operating income in the next ten years to accelerate the phase-out of the coal-fired power industry.

Finally, 1 billion yuan will be used to accelerate the upgrading and transformation of coal-fired power generation companies and reduce the carbon dioxide and air pollutants produced by coal-fired power companies through technological innovation.

Subsidies are funded from the following sources:

Our funding source will be composed of two parts. The first is from the carbon tax levied by the government every year. The Carbon Tax Research Group of the Ministry of Environment

²² Ministry of Finance of the People's Republic of China (Ministry of Finance), Notice on the Budget of Local Subsidies for Renewable Energy in 2020, http://www.gov.cn/zhengce/zhengceku/2020-02/05/content_5474795.htm

²³ Lin Jiang, China 2030 wind power and photovoltaic still have huge room for improvement, BJX, Feb 5, 2021, <https://news.bjx.com.cn/html/20210205/1135003.shtml>

²⁴ Peicong Li, Biomass power generation outlook By 2030, the proportion of biomass power generation may exceed 5%, Dec 27, 2018, <https://www.forestry.gov.cn/zlszz/4264/20181227/160029925465733.html>

pointed out that the beginning of the carbon tax will increase the country's annual fiscal revenue by 180 billion yuan²⁵. The second source is the collection of resource taxes on enterprises that use fossil energy. According to the revenue and expenditure report of the Ministry of Finance of China in 2020, the resource tax of the Chinese government's tax revenue is 175.5 billion yuan²⁶. We will use the revenue from the above two taxes to provide subsidies for energy companies.

Specific subsidies for energy company under this policy are as follows:

product subsidies

Product subsidies are subsidies based on the amount of electricity generated from renewable sources. The most widely used form of product subsidy is the Feed in Tariff ²⁷(FIT). By providing a financial subsidy to renewable energy products, product subsidies protect the investment profits of renewable energy developers, thereby attracting more commercial capital to the sector and promoting industrial development.

Investment subsidies

The investment subsidy is to provide funds for investors participating in the technological upgrading of the traditional coal-fired power station to reduce investors' investment burden. The advantage of subsidizing investors is that it can encourage investors to invest directly and promote the development of the industrial chain.

Policy Authorization Tool

In China, administrative regulations are the general term for regulations formulated by the State Council to lead and manage various administrative tasks of the country in accordance

²⁵ Han Zhang, China's carbon tax era may be coming, Sina, May 31, 2010, <http://finance.sina.com.cn/chanjing/sdbd/20100531/07298028322.shtml>

²⁶ The Ministry of Finance, Budgetary revenue and expenditure in 2020, Jan 28, 2021, http://www.gov.cn/xinwen/2021-01/28/content_5583244.htm

²⁷ Will Kenton, What Is a Feed-In Tariff (FIT), Investopedia, Feb 24, 2021, <https://www.investopedia.com/terms/f/feed-in-tariff.asp>

with the Constitution and laws, and in accordance with the "Ordinance concerning the Procedures for the Formulation of Administrative Regulations." Administrative regulations refer to the general term for normative documents formulated by the State Council in accordance with the Constitution and laws in accordance with legal procedures related to the exercise of administrative powers and the performance of administrative duties. The main body of the formulation of administrative regulations is the State Council.

Administrative regulations are formulated under the authorization of the Constitution and laws, administrative regulations must be formulated through legal procedures, and administrative regulations have legal effect. The issuance of administrative regulations requires the Premier of the State Council to sign an order of the State Council. The effectiveness of administrative regulations is second only to the constitution and laws, and higher than departmental rules and local regulations.²⁸

After this proposal is submitted, we need to implement the procedures for the formulation of administrative regulations. First, we need to declare the proposal to the State Council. Then we need legal institutions to organize the drafting of our draft and report the progress of the draft to the State Council on time. Then, the proposal we drafted will be announced to the public for comments. The time limit for soliciting opinions is often no less than 30 days, which means that our draft needs at least 30 days to pass the approval of the State Council. After the drafting is completed, we will submit our revised version to the State Council's legal affairs agency for review. After the State Council decides to approve our proposal, the Premier will sign an order of the State Council to approve this administrative regulation. General administrative regulations will be implemented 30 days after it is promulgated. Therefore, it takes about two months to complete the proposal. Compared with legislation, administrative regulations come into force faster. Legislation generally

²⁸ Yuan Xue, China's legislative system, npc, http://www.gov.cn/guoqing/2017-11/08/content_5238056.htm

requires three deliberations before a final vote can be made. If the proposal still needs further study after three deliberations, then the proposal must be submitted to a Constitution and Law Committee for further deliberation. Therefore, if we choose to use administrative regulation instead of legislation, we will significantly reduce the time required to pass our policies.

Policy Implementation Tool

The proposal will promote the development of renewable energy and the reduction of air pollutants in China through subsidies to renewable energy companies as well as coal-fired power generation companies. First, after The State Council promulgates administrative regulations, the Ministry of Finance, as an administrative agency of the state, needs to allocate specific subsidy funds according to our budget arrangements. Then, by 30 March each year, the power company or the relevant provincial department will submit an application to apply subsidy funding. National state-owned power generation enterprises can directly apply for subsidies from the National Energy Administration; local independent power companies apply for subsidies to the National Energy Administration through the local provincial finance and energy authorities. After the National Energy Administration has reviewed the applications, the Energy Administration needs to confirm with the Ministry of Finance and the National Development and Reform Commission to eventually include eligible enterprises in the subsidy list. Finally, the Ministry of Finance will then provide specific subsidies according to the number of eligible enterprises in each region and in proportion to the distribution of these enterprises across the country.

Policy analysis

First of all, this policy can accelerate the transformation of the traditional coal-fired power station. Since China still relies heavily on coal for power generation²⁹, improving the coal-fired power station's ability to dispose of the exhaust gas after burning coal is one of the main ways to reduce air pollution and greenhouse gas emissions. Therefore, this funding can be used to subsidize the traditional coal-fired power station to purchase foreign patents for advanced technologies and increase scientific research funding to improve the ability to clean up exhaust gas emitted by coal-fired power station.

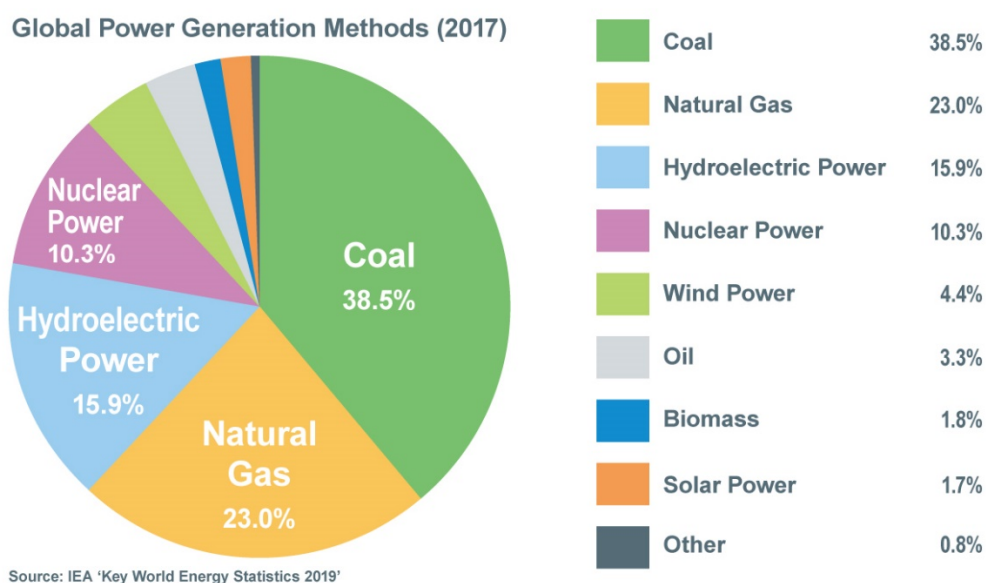


Figure 1 Global Power Generation Methods in 2017³⁰

²⁹ Muyu Xu, "China coal surge puts supply record, power jump within reach", Reuters, Oct 22, 2021, <https://www.reuters.com/business/energy/china-coal-surge-puts-supply-record-power-jump-within-reach-2021-10-22/>

³⁰ ROHM, How electricity reaches our homes and everyday devices, Jul 19, 2021, <https://www.rohm.com/blog/-/blog/id/9391095>

At present, Coal-Fired Power is still the primary method of power generation in most countries of the world. But in order to reduce air pollution and greenhouse gas emissions, many countries are investing in new technologies to improve the efficiency of coal combustion and the ability to filter and purify exhaust gas. At present, the United States has a very advanced nitrogen oxide filtration and purification system. In the United States, most coal-fired power plants use wet flue gas desulfurization (WFGD) to control sulfur dioxide emissions. And some coal power plants use low-nitrogen burners, over-fire air, and selective catalytic reduction (SCR) systems to control nitrogen oxide emissions. In addition, about half of coal-fired power station also use activated carbon injection systems (ACI) with bag filters to control mercury emissions³¹. The United States has a patent for Rotating Opposed Fire Air System (ROFA) technology³². This technology draws about 30% of the air volume from the secondary wind of the boiler and shoots it into the upper part of the furnace by means of high-speed jet through asymmetrically placed nozzles. Thus, the temperature distribution in the furnace is improved and the contact area between coal and air is enlarged, thus greatly reducing the formation of nitrogen oxides. China's coal-fired power station can use this government subsidy to purchase patents related to polluting gas purification devices from these coal-fired power station in the United States, thereby reducing the concentration of air pollutants and greenhouse gas emitted by coal-fired power station.

In addition to buying patents from other countries, Chinese coal-fired power station can also use the subsidies to develop their own exhaust filtration systems to reduce air pollution and greenhouse gas emissions. As a large coal-fired power generation country, China has long been committed to innovating and developing power generation technology and pollutant

³¹ Ravi K. Srivastava , Robert E. Hall , Sikander Khan , Kevin Culligan & Bruce W. Lani (2005) Nitrogen Oxides Emission Control Options for Coal-Fired Electric Utility Boilers, Journal of the Air & Waste Management Association, 55:9, 1367-1388, DOI: 10.1080/10473289.2005.10464736, <https://doi.org/10.1080/10473289.2005.10464736>

³² MOBOTEC, Model ROFA - Rotating Opposed Fire Air System, <https://www.energy-xprt.com/products/mobotec-model-rofa-rotating-opposed-fire-air-system-438785>

control technology. In this year's national two sessions, the coal-fired power stations are required to invest more in research and development of technology to filter exhaust gas, according to the government work report³³. Therefore, increasing subsidies to the coal-fired power station is in line with the government's planning requirements.

The United States, for example, has continued to increase its support for the coal-fired power plants to develop new technologies to reduce air pollutants and carbon dioxide emissions in recent years. In 2020, the U.S. Department of Energy awarded \$81 million³⁴ to study Coal FIRST (Flexible, Innovative, Resilient, Small, Transformative). The plan applies to future coal-fired power plants to provide safe, stable, and reliable energy. Such new coal-fired power plants will have the following characteristics: the ability to operate flexibly to meet the needs of the grid; Use innovative, cutting-edge components to improve efficiency and reduce emissions; Providing flexible electricity. The selected projects will complete (1) design development; (2) host site evaluation and an environmental information volume; (3) an investment case analysis; and (4) a system integration design study to advance the design of an engineering-scale prototype³⁵. The way the United States subsidizes the coal power industry is something we can imitate. China's coal-fired power plants will be able to use the money to research new technologies to reduce polluting gas emissions and develop efficient clean combustion technologies. The subsidy will help speed the transition of China's coal-fired power plants to more efficient combustion and less pollution.

Secondly, this policy will provide 1 billion yuan in compensation for coal-fired power stations that voluntarily withdraw from the market. This compensation will be used to cover the

³³ Matthew Farmer, Three key points for power generation from China's five-year plan, PowerTechnology, 09 Mar,2021, <https://www.power-technology.com/news/industry-news/china-five-year-plan-three-points-nuclear-coal-energy-efficiency/>

³⁴ Office of Fossil Energy and Carbon Management, DOE Announces Intent to Commit \$81 Million for Coal FIRST Design Development, Energy.Gov, Oct 28, 2020, <https://www.energy.gov/articles/us-department-energy-coal-first-initiative-invests-80-million-net-zero-carbon-electricity>

³⁵ Fang Yue, The U.S. Department of Energy is rolling out intensive deployment of advanced coal, hydro, and Marine energy, Casisd, Aug 30, 2019, http://www.casisd.cn/zkcg/ydkb/kjqykb/2019/kjqykb201906/201908/t20190830_5373949.html

financial losses of the coal-fired power station when they withdraw from the market. It will also provide funds for the livelihood of employees who have lost their jobs because of the closure of coal-fired power stations. Providing coal-fired power stations with compensation that exceeds their operating income will promote the willingness of coal-fired power stations to withdraw from the market. This will reduce the proportion of traditional coal-fired power stations in China's energy structure, and it also means that polluting and greenhouse gas emissions will be reduced. Germany has already started to phase out its coal-fired power stations in this way. Last year, the German government announced that they would spend €40 billion to compensate laid-off coal-fired power stations workers, shuttered coal-fired power stations, and promised new jobs for local coal-fired power stations workers. The Act on the Phase-out of Coal-fired Power Plants in Germany, passed by the Bundestag, also mentions a compensation of 4.35 billion for coal-fired power stations. Germany is expected to phase out coal power by 2038.³⁶

In addition to financial support for the coal power industry, subsidies will also be used to promote the development of renewable energy companies. Accelerating renewable energy development is the most effective way to reduce air pollutants and greenhouse gas emissions³⁷. Therefore, adjusting China's current energy consumption structure and vigorously developing renewable energy is conducive to improving China's air quality. Thus, the following article will discuss how the subsidy of this policy can promote the development of renewable energy enterprises.

For renewable energy generation companies, we will first use feed-in tariffs (FIT) to subsidize the electricity they produce. Feed-in tariffs is a long-term subsidy mechanism aimed to accelerate investment in renewable energy. The government will provide cost-

³⁶ An Jing, Germany is legislating to phase out coal at a cost of more than 40 billion euros, IN-EN, Sep 7, 2020, <https://www.in-en.com/article/html/energy-2295407.shtml>

³⁷ United Nations, Renewable Energy Sources Cut Carbon Emissions, Efficiently Increase Electricity Output Worldwide, Delegates Say in Second Committee, Oct 16, 2018, <https://www.un.org/press/en/2018/gaef3501.doc.htm>

based compensation to renewable energy companies to ensure that the price of the electricity they produce is fixed. Grid companies would have to pay renewable energy companies the price which is fixed by the government. Feed-in tariffs usually involve long-term agreements and prices tied to the cost of production of the energy. The long-term contracts and guaranteed prices shelter producers from some of the risks inherent in renewable energy production, encouraging investment and development³⁸.

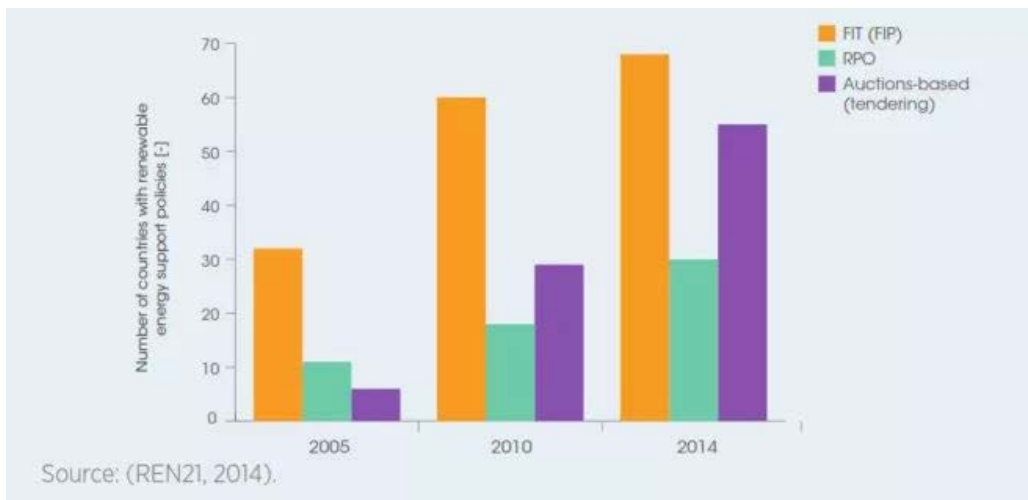


Figure 2 Number of countries with renewable energy support policies³⁹

FIT is the most typical product subsidy policy and the most widely used method to support renewable energy in the world. FIT play a key role in promoting the development of renewable energy, especially for some renewable energy enterprises with high initial investment cost. FIT can guarantee the investment profits of energy developers and provide competitiveness for these renewable enterprises in the market, thus promoting the

³⁸ Will Kenton, What Is a Feed-In Tariff (FIT), Investopedia, Feb 24, 2021, <https://www.investopedia.com/terms/f/feed-in-tariff.asp>

³⁹ Zhenzhi Lu, Comparison between China and Germany: Feed-in tariff Subsidies (FiT), zhihu, Jul 26, 2019, <https://zhuanlan.zhihu.com/p/75380902>

development of the industry. In the early stage of renewable energy development, China's photovoltaic power industry developed slowly due to the high cost of photovoltaic power generation and the lack of market incentives. In 2006, President Hu Jintao approved the Renewable Energy Law to promote the formation of photovoltaic power market, using FIT as a form of subsidy for the photovoltaic industry⁴⁰. This law provides a solid guarantee for the fledgling photovoltaic power industry and reduces the risk for investors.

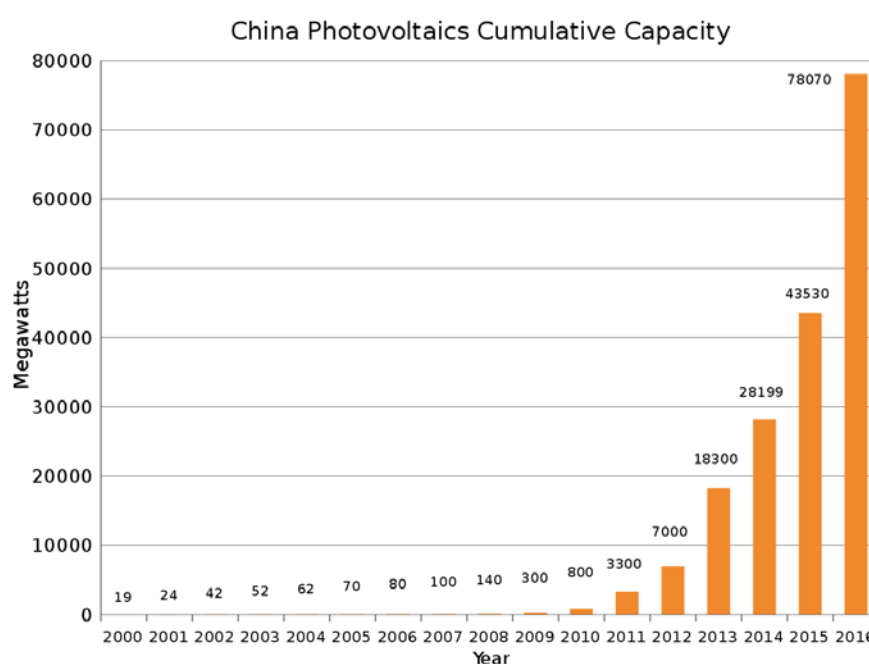


Figure 3 China Photovoltaics Cumulative Capacity⁴¹

In 2006, China's photovoltaic cumulative capacity was 80MW. After the FIT method enacted in the photovoltaic industry, China's photovoltaic cumulative capacity has reached 78070 MW by 2016⁴². Therefore, the FIT has a considerable role in promoting the fledgling renewable energy industry. At present, China's photovoltaic and wind power generation industry is very mature with low installed cost, so the FIT model will be applied to the

⁴⁰ Jintao Hu, Hu Addressed the full text of 2005 Beijing International Renewable Energy Conference, Xinhua, Nov 7, 2005, http://www.gov.cn/ztl/2005-11/09/content_95296.htm

⁴¹ Delphi234, Wikimedia, May 11, 2015, https://commons.wikimedia.org/wiki/File:China_Photovoltaics_Installed_Capacity.svg

⁴² Li Zhu, Statistics on Installed PV capacity in China from 2006 to 2016, NE21, Apr 27, 2016, <https://www.ne21.com/news/show-75056.html>

fledgling renewable energy industry such as biomass power generation and nuclear power⁴³, which has high investment costs, so as to promote the development of these renewable energy industries.

In addition to providing subsidies to renewable energy companies through FIT, we can also provide cash subsidies directly to renewable energy companies. Cash subsidies can provide large sums of money for renewable energy projects. The current global economic slowdown with Coronavirus spread makes it difficult to stimulate investment through tax incentives in a tight economic environment. Direct cash subsidies to renewable energy companies could alleviate the current cash flow constraints of renewable energy companies. In the US, for example, after the financial crisis in 2008, the number of investors in the market declined significantly. So, Section 1603 of the American Recovery and Reinvestment Tax Act of 2009 replaced the previous production tax credit (PTC) and investment tax credit ("ITC") policies to provide a 30% cash subsidy for eligible renewable energy companies. Since the program's inception at the end of June 2009, the government has disbursed approximately \$5 billion in cash subsidies. Total wind power generating capacity hit more than 35,000 MW in the United States in 2009, a 39% increase from the end of the previous year⁴⁴.

However, our policy may also lead to some inevitable problems and risks.

Increasing subsidies for renewable energy could place an excessive financial burden on the government. At present, the scale of China's new energy enterprises is far more extensive than planned, and the demand for subsidy funds has increased significantly. By the end of 2017, the installed capacity of solar power had reached 130 million kilowatts, fulfilling the target of no less than 110 million kilowatts in the 13th Five-Year Plan in just two years. In

⁴³ Installed costs of various power generation technologies, 2020-2050, Sohu, Jun 15, 2020, https://www.sohu.com/a/401888181_778776

⁴⁴ Wind Power Grows 39% for the Year in U.S.: 9,900 MW. Total capacity hit more than 35,000 MW, ewind, Jan 26, 2010, <https://www.ewind.es/2010/01/26/wind-power-grows-39-for-the-year-in-u-s-9900-mw-total-capacity-hit-more-than-35000-mw/3638>

2019, the installed wind power capacity reached 210 million kW, one year ahead of the target of no less than 210 million kW set in the 13th Five-Year Plan. As more renewable energy companies enter the market, demand for subsidies is rising fast. China's arrears on renewable energy subsidies are estimated to reach 300 billion yuan⁴⁵. That means the government can't afford to keep its promises of subsidies for renewable energy companies. This will lead to a squeeze in cash flow for renewable energy companies and a sharp rise in financial costs. Subsidy arrears lead to continuous tension in the operating cash flow of most renewable energy enterprises, and eventually face the crisis of bankruptcy. And the default of government subsidies will also affect the expectations and confidence of enterprises and private capital to invest in the renewable energy industry. From the perspective of bank loans, it is more difficult for new energy enterprises to obtain bank loans. Financing costs rise due to long-term arrears of subsidies and policy uncertainties.

Political Analysis

Renewable energy companies will be key stakeholders in this policy. Since the implementation of the Renewable Energy Law in 2006, China has entered a period of rapid development of renewable energy, and the market size has constantly been expanding. China has achieved significant results in the development and utilization of renewable energy. The cumulative installed capacity of hydropower, wind power, and photovoltaic power generation ranks first in the world. The proportion of renewable energy in the energy structure has been increasing. However, because of the large upfront investment required for renewable energy, Chinese renewable energy companies are currently in a very passive position. Those companies that are small in scale and have tight cash flow are extremely vulnerable to cash flow drying up, leading to difficult business situations. As a result, most of

⁴⁵ Jinghua Xi, What are the chances of the grid issuing debt to cover a \$300 billion shortfall in renewable subsidies?, jiemian, Aug 06, 2020, <https://www.jiemian.com/article/4780138.html>

China's current renewable energy enterprises are facing serious survival problems such as a severe lack of liquidity and a Capital Chain Rupture. In July 2018, the Development and Reform Commission of Shandong Province investigated the Qiquan Energy Group Company, a private renewable energy company in Shandong Province, and concluded in the report that the company is now facing closure due to insufficient state funding for renewable energy generation subsidies. In response to this situation, Shandong Qiquan Energy Group has made many efforts of its own to solve the survival problems it faces, but their situation has not improved. The person in charge of the company said: "We built state-supported and encouraged renewable energy projects in line with our national industrial policy, but we ended up driving companies to the wall because of poor implementation of our national policy. Our management has pledged all their assets to borrow money from the bank to keep the business going. If the country doesn't solve its problems, we will go bankrupt."⁴⁶

In addition, due to the impact of COVID-19, renewable energy companies such as photovoltaics and wind power are currently suffering a huge impact. In order to control the pandemic, the State Council issued strict instructions to supervise the movement of people across the country and extended the time to resume work⁴⁷. From the perspective of cost, the delay in resuming work for small and medium-sized renewable energy companies increases their financial burden. During this period, the companies cannot start production but still must pay employees' wages. According to a report by the Energy and Environmental Policy Research Center of Beijing Institute of Technology, due to the impact of the COVID-19 pandemic in 2020, some photovoltaic power generation companies' delayed start has

⁴⁶ Su Chang, A new energy enterprise due to renewable energy subsidies defaulted on the verge of bankruptcy, the dilemma will be how to crack ,Ofweek, Aug 13, 2018, <https://solar.ofweek.com/2018-08/ART-260006-8440-30256761.html>

⁴⁷ Qiaosu Zhang, Schedules for the resumption of work and classes in 31 provinces, autonomous regions and municipalities, xinhuanet, Feb 2, 2020, http://www.xinhuanet.com/politics/2020-02/02/c_1125520608.htm

missed the application time point for subsidy projects⁴⁸. In the end, some companies lost the subsidies they had received, which led to increased financial burdens.

Therefore, the sufficient subsidies provided by this policy will be welcomed by renewable energy companies. As the COVID-19 pandemic has been effectively controlled in China and the national economy is accelerating recovery, providing adequate subsidies for renewable energy at this point will help alleviate the current tight cash flow of the companies and reduce their financial costs. What's more, this subsidy can increase market expectations and confidence in investing in the renewable energy industry. As our stakeholders in this policy, renewable energy enterprises are desperately need the government's financial subsidies. They urgently need the government to provide them with the financial assistance necessary to overcome the current difficulties of the renewable energy industry. So, we will have their full support for this policy.

President Xi Jinping, general secretary of the Communist Party of China, is also a key stakeholder in the policy. In January 2021, Xi Jinping said at the World Economic Forum "Davos Agenda" that China will strengthen ecological construction, accelerate the adjustment and optimization of industrial structure and energy structure, and advocate green and low-carbon production and lifestyle⁴⁹. In addition, at the UN General Assembly in 2020, President Xi Jinping also made commitments to tackling global warming and environmental protection, announcing that China would pledge to achieve CO2 emissions peak before 2030 and carbon neutrality before 2060. He said that "As long as it is beneficial to all humanity, China should be obligatory to do it and do it well. China is formulating a plan

⁴⁸ Xing Lu, Assessment of the impact of COVID-19 on the renewable energy sector, CEEP-BIT, Feb 10, 2020, <https://ceep.bit.edu.cn/docs/2020-02/20200215040932056532.pdf>

⁴⁹ Qiaosu Zhang, Xi Jinping delivered a special address at the World Economic Forum's "Davos Agenda" dialogue, Xinhua net, Jun 25, 2021, http://www.xinhuanet.com/politics/leaders/2021-01/25/c_1127023883.htm

of action and has begun to take concrete measures to ensure the set goals.⁵⁰ The goal of our policy is consistent with What Xi Jinping has said on global warming, so I think the central government will strongly support it. Moreover, this policy will help demonstrate the Chinese government's responsibility in addressing global climate change. After US President Donald Trump announced that the US would withdraw from the Paris Agreement in 2020, Xi Jinping's more active participation in global climate governance is conducive to enhancing China's voice in international affairs, demonstrating China's international influence, and even promoting China to become a leader in global climate governance. Manuel Pulgar-Vidal, Leader of WWF's global Climate & Energy Practice, highly appreciates Xi's initiative, he said "This is potentially a game-changer. By announcing their bold intentions now, China, as the world's biggest producer of greenhouse gasses, is showing emerging leadership on climate change. China's move will put pressure on other big emitting countries to also take bold action."⁵¹

And our policies will also promote the development of the Belt and Road initiative proposed by Xi Jinping. The Belt and Road is a transnational economic belt initiated and led by the Chinese government in 2013, covering countries in mainland China, Central Asia, North and West Asia, the Indian Ocean coast, the Mediterranean coast, South America, and the Atlantic Ocean⁵². It is China's most important national strategy. Improving the global climate and ecological environment is a priority of the Belt and Road Initiative and an inevitable requirement for participating countries. Our policy will reflect Xi's determination to address climate issues in the Belt and Road initiative and Xi's international influence and leadership as an advocate of the Belt and Road. As of March 2021, Belt and Road participating countries,

⁵⁰ Valerie Volcovici, China pledges to achieve CO2 emissions peak before 2030, carbon neutrality before 2060 -Xi, Reuters, Sep 22, 2020, <https://www.reuters.com/article/un-assembly-climatechange-idUSL2N2GJ105>

⁵¹ Mandy Woods, China's game-changing pledge could boost global momentum on climate action, WFF, Sep 23, 2020, https://wwf.panda.org/wwf_news/?876366/China-climate-NDC

⁵² Andrew Chatzky, China's Massive Belt and Road Initiative, CFR, Feb 28, 2020, <https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative>

including Chile, Costa Rica, New Zealand, Hungary, Singapore, South Africa, and Ukraine, have made carbon-neutral commitments⁵³. In the future, more countries will also participate in the Belt and Road initiative to tackle global climate issues.

The Chinese public is very concerned about climate change and air pollution. A survey conducted by the China Centre for Climate Change Communication showed that nearly 97 percent of respondents supported the government's policies to control carbon dioxide and other greenhouse gas emissions, and 94 percent supported the Chinese government's continued participation in the Paris Agreement. And 72.6 percent of respondents believe there is a linkage between climate change and air pollution⁵⁴. And the Chinese public also gives high praise to the government for its efforts to promote low-carbon living.

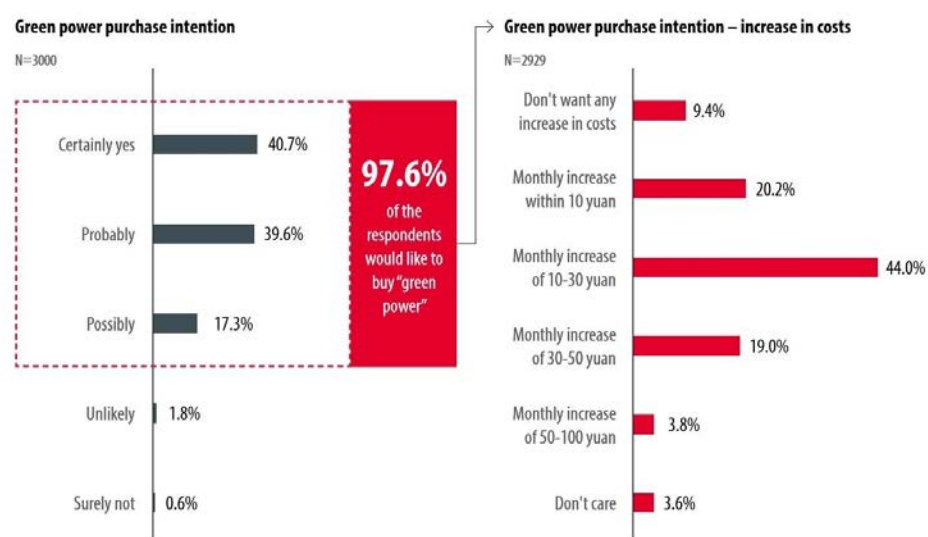


Figure 4 Survey of people's willingness to buy green electricity⁵⁵

⁵³ Er Xue, what climate change risks do BELT and Road investments face, CFEJ, Aug 13, 2021, http://www.cfej.net/jizhe/cmlw/202108/t20210813_856348.shtml

⁵⁴ Li Jing, Does the Chinese public care about climate change, China Dialogue, Sep 21, 2018, <https://chinadialogue.net/en/climate/10831-does-the-chinese-public-care-about-climate-change/>

⁵⁵ Feng Hao, Yao Zhe, Urban Chinese willing to pay extra for green electricity, China Dialogue, Sep 19, 2016, <https://chinadialogue.net/en/energy/9246-urban-chinese-willing-to-pay-extra-for-green-electricity/>

A survey of 3,000 consumers in major cities by China Renewable Energy Industries Association (CREIA) found that there is a strong public appetite to buy green electricity generated from renewable sources. Among them, 40.7 percent said they would definitely buy green electricity, while 39.6 percent said they were very likely to do so. And of those who are willing to buy green electricity, more than 90 percent of respondents say they are willing to pay higher electricity bills to support the development of green electricity⁵⁶. As a result, the public has a positive attitude towards tackling climate change and reducing carbon dioxide emissions.

To measure the pros and cons of a subsidy policy, it is necessary to analyze the benefits received by all stakeholders. If all stakeholders can "reluctantly accept" the policy, then the policy is good. Conversely, if a subsidy policy is introduced that one of the stakeholders is very favorable or unfavorable, the policy is biased.

Our policies may have an adverse impact on one of stakeholders, the local government, resulting in ineffective implementation of our policies. Our subsidy policy does not take into account the enthusiasm of local governments. Especially in terms of local taxation, the interests of local governments have not been fully considered. The policy of tax reduction and exemption for renewable energy may lead to a reduction in the fiscal revenue of the local government. It is difficult for the renewable energy industry to achieve rapid, healthy and steady development without the strong support of local governments. At present, the wind power industry has been resisted by local governments to varying degrees in some areas. The main reason is that in the development of the renewable energy industry, local governments have not obtained corresponding benefits. During the construction of the Jiuquan Wind Power Base in Gansu Province, the local government required wind power

⁵⁶ Feng Hao, Yao Zhe, Urban Chinese willing to pay extra for green electricity, China Dialogue, Sep 19, 2016, <https://chinadialogue.net/en/energy/9246-urban-chinese-willing-to-pay-extra-for-green-electricity/>

equipment manufacturers to set up local factories and required the renewable energy companies involved in the project to purchase locally manufactured wind turbines for the sake of local economic interests. The local government even requires participating renewable energy companies to transfer their shares to local companies.⁵⁷ In this way, the local government can get more tax revenue. China's power system has been dominated by coal power for a long time, so the existing planning system, management system, operation system, and even thinking mode is all "coal power preference." Local governments prefer capital-intensive industries⁵⁸, which means more GDP growth and tax revenue. In particular, large coal-fired power plants generally have a large amount of investment and can bring more tax revenue to local governments, so they are also the industries that local governments focus on encouraging investment. The direct tax revenue from wind power enterprises is less than that from coal power enterprises. Local governments received very little tax revenue from wind farms in the first five years, as wind farms had to make up for losses incurred in previous construction. According to the study, tax revenue from coal power in Fujian province is 2.9 times higher than that from wind power, and in Ningxia Autonomous Region, it is 6 to 10 times higher⁵⁹. GDP and employment are also very important to local governments. Take the wind power industry in renewable energy as an example. The GDP that wind power can create is comparable to coal power, with only a 15-20% difference between the two. But in terms of employment, a large coal power plant may create more than 10,000 jobs overall, while wind power, due to its smaller scale, creates only around 650 jobs⁶⁰. Both GDP and employment rate are important factors to measure

⁵⁷ Xiaoyan Zhang, What is the difference between wind power and coal power in the eyes of local governments, ccoalnews, May 16, 2017, <http://www.ccoalnews.com/201705/16/c13446.html>

⁵⁸ Yao Yang, Local governments' preference for capital-intensive industries is detrimental to structural adjustment, SOHU, Jan 19, 2010, <https://business.sohu.com/20100119/n269695441.shtml>

⁵⁹ Yongle Chen, Wind and coal began to squeeze out of each other, Sina, May 16, 2017, <http://finance.sina.com.cn/chanjing/cyxw/2017-05-16/doc-ifyfeivp5772290.shtml>

⁶⁰ Shuwei Zhang, How should local governments weigh the debate between coal power and wind power, BJX news, Nov 4, 2016, <https://news.bjx.com.cn/html/20161104/786413-2.shtml>

the performance of local governments. Therefore, the implementation of our policies may lead to opposition from local governments and thus fail to achieve our policy goal.

In addition, the policy could increase political tensions between coal exporters and China. In 2020, China officially banned coal imports from Australia, leading to a sharp drop in trade between the two countries. China's decision is a blow to Australia, the world's largest coal exporter, and will result in the loss of its second-largest coal market. Some Australian political scientists blamed this on China's political retaliation against Australia. "It's not market forces, it's politics all the way down," says Robyn Eckersley, a political scientist at Melbourne University.⁶¹ However, the main reason for the ban on Australian coal imports this time is that China is stepping up efforts to clean up heavy pollution. Chen Hong, director of the Australian Studies Center at East China Normal University, said: "Some in Australia have repeatedly politicized trade issues out of a Cold War mindset. They called China's suspension of importing Australian coal as "economic coercion". This is pure speculation."⁶² China's domestic demand for coal is expected to decline as support for renewable energy increases, which will have a negative impact on the economies and employment in coal exporting countries. These countries may shift their domestic contradictions onto China, leading to international political tensions.

Recommendation

Since the reform and opening-up, China has always placed economic growth at the top of its strategic planning and decision-making agenda. Economic development has always been the most important dimension for China, and economic development has always been given priority in national strategy, planning, and policymaking. However, extensive economic

⁶¹ Damien Cave, When China Battles the World's Biggest Coal Exporter, Coal Loses, NY Times, Dec 17, 2020, <https://cn.nytimes.com/asia-pacific/20201217/china-coal-climate-moon-mission-rocks/dual/>

⁶² Lijun Huang, Why Is China abandoning Australian coal, SeeTao, Oct 15, 2020, <https://www.seetao.com/details/42151.html>

development for a long time has also brought about a series of the destruction of resources and the environment, especially the increasingly serious air pollution and the continuous increase of greenhouse gas emissions. These problems have become bottlenecks restricting further economic and social development and have a serious impact on public life and health. Therefore, environmental governance will be an important part of China's future development. So, I highly recommend that you adopt my policies to deal with the future challenges of air pollution in China.

Despite this proposal's economic and political challenges, I think it's important that we implement this policy. The two biggest challenges to the policy are the central government's current deficit in subsidies and the local government's resistance to the policy. Both problems, however, are solvable. The central government is strengthening the review mechanism for renewable energy companies that need subsidies and is pushing for new tax policies to fill the fiscal gap in renewable energy subsidies⁶³. In addition, local governments, even though they may not be willing to cooperate in the policy implementation process actively, they must carry out the plans, policies, decisions, and orders of the central government due to China's centralization system. So, if our policies are successfully passed, local governments must implement them even if they disagree with us.

The advantages of our policy are clear. First of all, for renewable energy enterprises, the subsidies in our policy will help them reduce the risks they face in the early stage of development due to the high cost of investment and encourage social capital to participate in the development of the renewable energy industry. Second, for the traditional coal power industry, the compensation we provide for their exit from the power generation market will protect their future development after exit from the market. The money will also be used to pay for the benefits of workers who lost their jobs after the coal and power companies

⁶³ Jia Liu, The problem of photovoltaic subsidy gap has been solved, Xinhua net, Feb 22, 2019, http://www.xinhuanet.com/2019-02/22/c_1124148618.htm

withdrew from the market. So, this policy will promote the development of renewable energy and promote the phase-out of coal power generation in China in the future, thereby improving air quality.

In addition, politically, the implementation of this policy will help increase China's international influence in environmental governance and addressing climate issues. This policy will be highly supported, including Xi Jinping and the central government. As the world's second-largest economy, second only to the United States, China's achievements in the field of economic development have been evident to all. Therefore, as a big country, strengthening its international influence will be one of China's goals in the international arena in the future. We should seize this opportunity to show China's ambition to tackle environmental problems. In addition, President Xi Jinping's concept of building a community with a shared future for mankind has mentioned that as long as it is beneficial to all mankind, China should be duty-bound to do it and do it well⁶⁴. Tackling air pollution and other environmental problems will benefit China's future development and the world. Our efforts to tackle air pollution will reflect China's sense of responsibility for global affairs. Therefore, I hope my proposal can get your support and be carried out successfully.

⁶⁴ Guangyu Yang, Xi: As long as it is beneficial to mankind, China should be duty-bound to do it and do it well, People, Jan 25, 2021, <http://politics.people.com.cn/n1/2021/0125/c1024-32011483.html>

Curriculum Vita

Kangyi Shao was born on November 14, 1996, in Shanghai, China. He received his undergraduate degree from Case Western Reserve University. He received his B.S. in Statistics in June 2020. He enrolled at Johns Hopkins University in August 2020 and received his master's degree in Public Management in December 2021. He participated in extracurricular activities during his undergraduate years, such as volunteering at the museum. He hopes to participate in government-related work in the future.