Research on Fiscal and Tax Policies to Promote the Development of New Energy in China

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ABSTRACT

In the context of energy revolution and climate change, low-carbon economy has become the trend of world economic development. At present, China's energy development is facing the problems of irrational distribution of energy structure, the contradiction between the type of energy, the per capita energy resources are relatively inadequate, and the energy efficiency is not high. At the same time, there are still some gaps between China's energy development and developed countries. This paper suggests that to accelerate the development of new energy, the national fiscal and taxation policy support is needed currently, and build fiscal and taxation policy system to promote development of China's new energy.

INTRODUCTION

Energy is the basis and driving force for national development. The security of energy supply is related to the overall situation of national economy and political construction. Throughout the history of human development, no country can achieve rapid economic development, maintain political stability and improve people's living standards in the absence of energy supply and excessive external dependence. In the 1970s, the outbreak of the energy crisis and the traditional energy and environmental problems caused by the global countries sounded the alarm, many countries turn to energy those which not only had a long-term supply, but also not pollute the environment. New energy is becoming an important choice for the United States, Japan, the European Union and other developed countries and organizations by virtue of cleaning, non-polluting and the rich reserve and so on, which has become an important direction for future energy development.

In the 21st century, China is facing the great task of building a well-off society in an all-round way and realizing the national rejuvenation. With the acceleration of the new urbanization process and the increase of the total economy, the future demand for energy would continue to grow. Although China has the vast territory and the total amount of energy is relatively rich, but energy per capita is very low for the reason that the large population. At present, China's energy consumption structure is mainly coal, oil supplement, if not change the status quo, and continue to rely on traditional energy, it can only rely on imports to meet China's energy needs and energy security will also suffer a major threat 30 years later. Moreover, the environmental problems caused by the development and utilization of traditional energy are becoming more and more prominent. China's greenhouse gas emissions account for the highest in the world. Coal and oil burns lead to extreme weather such as haze and acid rain. The people's
living environment is getting worse and the process of sustainable development is blocked. In 2013, China's new energy use accounted for 15.4% of the world's total use and increased to 16.7% in 2014. At the same time, we must also face the problems of China. New energy equipment manufacturing and new energy and power grid technology are still immature, residents’ consumer awareness is not strong to new energy products, and some new energy industry even faced overcapacity phenomenons, which are indicating that fiscal and taxation policies need to be further improved.

In June 2014, the State Council of China proposed that on the basic that the non-fossil energy accounted for 11.1% of the total energy consumption and the proportion of coal accounted for 64.2% of the energy consumption in 2014, according to the Energy Development Strategy Action Plan (2014-2020) issued in June 2014, China will achieve strategic objectives that non-fossil energy accounted for the proportion of primary energy consumption reached 15%, the proportion of natural gas to more than 10%, coal consumption in the proportion of control within 62% by 2020. How can China achieve this goal as soon as possible? How to better play the financial and tax policy effect? Based on the above problems, it is very important to study the fiscal and taxation policies that support the development of new energy sources. Therefore, this paper will summarize and evaluate the existing new energy fiscal and taxation policies, and put forward specific suggestions on the basis of summing up the lessons learned.

CHINA'S ENERGY STRUCTURE

According to the BP World Energy Statistics Yearbook 2015, China's primary energy consumption reached 2972 million tons of oil equivalent in 2014, accounting for 23% of the world's total energy consumption. At the same time, China is a great coal producer and consumer, China's total coal consumption in 2014 reached 1847 million tons of oil equivalent, accounting for 46.9% of the world's total energy output. In terms of coal consumption, China's coal consumption reached 1962 million tons of oil equivalent in 2014, accounting for world coal growth from 1998 to 2004, while energy consumption growth in recent years dropped to 2.18% in 2014.

According to the statistics, although China's energy consumption growth rate fell to its lowest level since 1998, it is still ahead of global energy consumption. China's energy structure optimization is of great significance to the adjustment of world energy structure.

The large amount of energy consumption has also brought a lot of emissions. According to the "China Environment Statistical Yearbook" (see Table 1), China's industrial emissions changed little from year 2011 to 2015, average of China's industrial emissions was 67175.38 billion cubic meters during the five years. As to sulfur dioxide and nitrogen oxides emissions, not only show a downward trend in the total, but also showed a certain degree of similarity in the structure, that is, the two pollutants in the industrial emissions were showing a declining trend, but emission from living of these two pollutants has increased year by year trend, which led to the overall decline trend of the two pollutants emissions is relatively slow. Dust emissions are showing an upward trend from year 2011 to 2014, but fell by 11.65% in 2015, trend of industrial dust emissions was consistent with the total, while dust emissions from living showed an upward trend. Since the vast majority of emissions were from the burning of fossil fuels, which showed that China had a strong dependence on traditional energy. A large number of emissions resulted in the gradual deterioration of China's environment, which
would also gradually affect the people's normal life. Therefore, it has become particularly urgent to improve and promote the use of new energy needs both in the industry and in life.

According to Chinese statistics, whether it is the production structure or consumption structure are mainly coal consumption for China. This is mainly due to China's energy endowment is coal-based and coal is the backbone of China's energy system. The proportion of China's coal production from year 2000 to 2014 had been maintained at 70% or more, and the proportion of China's coal consumption has been maintained at 60%the above since 2000.

China's coal consumption had risen from 68.5% in 2000 to 72.5% in 2007 in the rising stage. China's coal consumption has decreased from 71.5% in 2008 to 66% in 2014 in the decreasing stage. According to the IPCC Carbon Emissions Calculation Guide, coal has the highest emission factor in all energy sources, and a reduction in the proportion of coal can reduce carbon emissions from coal consumption in the same amount of energy consumption. For the reduction of greenhouse gas emissions, control of climate warming has an important role. In recent years, the proportion of China's coal has shown a downward trend, showing that China's energy structure has the effectiveness of significant adjustment in recent years.

China's oil consumption showed a gradual decline in the proportion of the trend, from year 2000 to 2014 the proportion of China's oil fell from 22% to 17.1%. According to the IPCC carbon emissions calculation guidelines, the carbon emission coefficient is between coal and natural gas, so the decline in the proportion of oil is also conducive to reducing greenhouse gas emissions.

China's natural gas consumption began to grow from 2000, and reached the highest peak of 5.7% to 2014. Natural gas is cleaner, and its carbon emissions are less than coal and oil. In the condition that new energy technology is not yet mature, the use of natural gas instead of other fossil energy to reduce the proportion of coal and oil has a certain feasibility. At present, the proportion of natural gas is still below 6%, but the future proportion of natural gas consumption will be further enhanced, and it will play a more important role in the energy structure optimization.

Other energy sources include electricity and other renewable energy sources, namely wind power, hydropower, solar energy and so on. From year 2000 to 2014, China's electricity and other energy in the proportion of energy consumption rose from 7.3% to 11.2%. The increase in the proportion of renewable energy consumption is conducive to greenhouse gas CO2 emissions, but the proportion is relatively low compared to other energy.

Source: China Environmental Statistical Yearbook 2015. Among them, unit of the industrial emission is the billion cubic meters; unit of sulfur dioxide, nitrogen oxides and dust emissions are 10,000 tons.

| TABLE 1 | TRENDS OF MAJOR AIR POLLUTANTS IN CHINA (2011-2015). |
|----------|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Year     | Industrial emissions Total     | Sulfur dioxide From industry | From living | Nitrogen oxides From industry | From living | Dust From industry | From living |
| 2011     | 674509                         | 2217.9           | 2017.2         | 200.4          | 2404.3         | 1729.7         | 36.6           | 1278.8         | 1100.9         | 114.8           |
| 2012     | 635519                         | 2171.6           | 1911.7         | 205.7          | 2337.8         | 1658.1         | 39.3           | 1235.8         | 1029.3         | 142.7           |
| 2013     | 669361                         | 2043.9           | 1835.2         | 208.5          | 2227.4         | 1545.6         | 40.7           | 1278.1         | 1094.6         | 123.9           |
| 2014     | 694190                         | 1974.4           | 1740.4         | 233.9          | 2078           | 1404.8         | 45.1           | 1740.8         | 1456.1         | 227.1           |
| 2015     | 685190                         | 1859.1           | 1556.7         | 296.9          | 1851           | 1180.9         | 65.1           | 1538           | 1232.6         | 249.7           |
| Average  | 671753.8                      | 2042.58          | 1812.24        | 229.08         | 2179.7         | 1503.82        | 45.36          | 1414.3         | 1182.7         | 171.64          |
CHINA'S ENERGY DEVELOPMENT PROBLEMS

At present, China's energy structure is not very reasonable, energy usage mainly relies on coal resources, while compared to the world's developed countries, energy consumption mainly rely on oil, natural gas and other relatively clean energy resources. Backward energy use, production methods lead to serious Pollution and carbon emissions, is not conducive to the sustainable development for modern social economy.

The distribution of energy structure is unreasonable

China's natural resources are not well distributed, the energy origin is mainly distributed in the southwest region, the northeast region and the northwest region, the northeast region is rich in coal resources, the southwest is rich in hydropower resources, the northwest region is rich in wind power and oil resources, and China's energy consumption area mainly distributed in north China and the eastern region. Unreasonable energy distribution structure of China's modern energy production and supply caused a huge challenge.

The proportion of energy types contradictory

China's energy consumption industry structure is characterized by a high proportion of the industrial sector. According to China Statistical Yearbook 2013, China's industrial sector consumed 71.6% of the total energy consumption, transportation took up 7.7% and commercial and civilian energy consumption took up 12.3%, agricultural production accounting for 3.1% of the proportion of energy consumption.

On the one hand, China's proportion of energy consumption reflects the backwardness of China's industrial production equipment, high energy consumption, low energy management, on the other hand, it also reflects China's economic growth is largely dependent on high energy consumption of the industrial sector.

Per capita energy resources is relatively inadequate

Although China's total energy resources are relatively abundant, but China has a large population, therefore per capita energy resources is at a low level in the world. Coal and water resources per capita is equivalent to 50% of the world average, oil and natural gas per capita resources only 7.7% and 7.1% of the world average. Less than 30% of the world's per capita level of cultivated land resources restricts the development of biomass energy. China's current total energy consumption is only lower than the United States, ranking second in the world, but the per capita consumption level is very low. In 2011, China's per capita consumption of oil was 161 tons of standard, although the increase is very fast, but it was about the United States 1/5, the gap was great.

Energy efficiency is not high

China's energy technology has made great progress, but compared with the international advanced level, there is still a big gap. From the point of view of China's energy processing conversion efficiency, since the 1980s, the change was not great. In recent years, many thermal power plants used waste heat for winter residents heating in the process of generating, but the energy consumption is still high, heat utilization rate
of only 71.25%. It was calculated that China's energy consumption was 0.36 US dollars / kg of standard coal, while Japan was up to 5.28 US dollars / kg standard coal, India also reached to 0.72 US dollars / kg standard coal. China's industrial boilers have only 80% of the energy efficiency of the developed countries. The energy consumption of the steel and metallurgical industries is twice that of the developed countries. The efficiency of the blowers and pumps is only 85% of the international level.

The overall efficiency level of China's energy system in 2012 was only the same as that of the OECD countries in the eighties, still 5 percent below the 90s. The efficiency was poor from the primary energy input to the terminal, compared with the developed countries there was still about 10% gap. China's energy consumption in the high energy-consuming industries has been greatly reduced in recent 10 years, which has led to the improvement of the energy efficiency of the terminal consumption. However, due to other aspects of the energy system, such as the conversion of the central power station, energy transmission Of the energy efficiency has not been fully excavated, resulting in that the overall efficiency of the energy system has not improved significantly, which meant that energy efficiency, improving energy efficiency should focus on system energy efficiency, by improving the energy efficiency of all aspects of energy systems to promote the overall efficiency of the energy system and achieve maximization.

Although China had a rapid development of new energy and some industries have a considerable scale, while when compared with developed countries, there were still a series of problems which need to be resolved, mainly in the following areas.

The holding rate of core technology is low. The development of new energy needs high-tech core technology as the support, the R & D investment was not enough and the high-end technical personnel was short, which leading to low core technology holdings of new energy. When compared to developed countries in Europe and America, there is a big gap. At present, because most of the domestic new energy core technologies are derived from foreign countries, and China's own basic research is weak, innovative, basic research work carried out less, start late, low level, lack of strong technical research support platform, lack of a clear system of technical development and long-term development of ideas, production and technical content is generally low and the quality of instability, can only meet the low-end needs as a result.

(B) The high cost of low output is widely existed. New energy has high cost, which is the biggest obstacle to its application. Due to the complexity of technology, small scale, new energy infrastructure and unit investment costs generally higher than conventional energy, resulting in that the unit cost is difficult to decline for new energy products. Assuming the cost of coal-fired power generation is 1 unit, the cost of nuclear power generation is slightly higher than that of coal and electricity. The cost of biomass power generation is 1.5 units, the cost of wind power is 1.7 units, and the cost of solar photovoltaic power generation is ranging from 11 to 18 units. In addition, although China has the largest installed capacity for wind power, solar energy, nuclear power in the construction, but in the field of wind power, the average utilization rate of wind turbines in China about 20%, which is significantly lower than the international average (international average utilization was from 25% to 30%).

(C) Policies and regulations need to be further improved. New energy is the main battlefield of international competition in the future, China should support the development of new energy from the legislative, industrial policy, financial support and other aspects of system. From the reality, China has promulgated the "Renewable Energy Law", but it is far from enough to meet the needs of the development of new
energy industry, mainly as follows: it did not establish a sound production technology standard system and quality standard certification system, leading to the fact that threshold new energy market into the technical was low, the manufacturers manufacturing technology was uneven, product quality was not high and so on.

TO PROMOTE THE DEVELOPMENT OF NEW ENERGY AND FISCAL POLICY

Current policy

To ensure the effective development of new energy sources, the smooth goals to realize new energy development, the Chinese government implemented several fiscal and taxation policies in order to develop new energy sources. The fiscal policy covered R & D, investment, production and consumption links, tax policy was mainly related to value-added tax, consumption tax and other corporate tax and corporate income tax incentives.

Fiscal policy

R & D subsidies for new energy technologies. In 2009, the government gave appropriate subsidies and subsidies for the key technological industrialization projects of photovoltaic power generation. In 2012, the same policy also appeared in the field of new energy vehicle research and development. At the same time enterprise with strong research and development capabilities could get the country's reward funds.

Investment subsidies for new energy projects. The first was the application of new energy buildings. In 2009, the Ministry of Finance and the Ministry of Housing and Urban implemented the "solar roof plan", so that the application of photovoltaic construction demonstration projects were subsidized, then the standard set at 20 yuan per W in principle, which also encouraged local governments introduce the relevant financial support policies. The second was the Golden Sun demonstration project. "Golden Sun Demonstration Project" began in 2009, the purpose was to promote technological progress and large-scale development of photovoltaic power generation. The third was biomass and bio-chemical industry. In the early stage of the 11th Five-Year Plan, the Chinese government made flexible loss subsidies for enterprises producing bio-oil substitutes such as fuel ethanol and biodiesel. In 2007, the finance began to support the development of non-grain liquid liquid fuels. The demonstration projects could be free of interest during the construction period Loans, which couldused to expand production or technological innovation. The fourth, was the new ocean energy. To promote the development and utilization of China's new marine energy, the Bureau of Ocean arranged special funds from the renewable energy to focus on supporting the demonstration projects whose installed capacity were not less than 500kW.

The production of new energy companies subsidies: benchmark electricity price. In 2009, in order to promote the healthy development of wind power industry, the Development and Reform Commission divided the country into four types of wind energy resources, and formulated the grid price for on-grid wind power, which was 0.51 yuan / kWh, 0.54 yuan / kWh, 0.58 yuan / kWh, 0.61 yuan / kWh respectively.

Consumer subsidies for new energy products. The first were user subsidies. In 2012, the government gave indirect subsidies for consumers who the purchased solar water heaters. In 2013 and 2015, the Ministry of Finance, together with the other four
ministries, introduced a three-year (2013-2015) and five-year (2016-2020) consumer subsidy policy. The second was that the government bought new energy products. The relevant policies and regulations asked the proportion of the total annual of the municipal and above government agencies and public institutions should purchase new energy vehicles which accounted for no less than 30% up to year 2016.

(5) Renewable Energy Development Fund. At November 2011, the Ministry of Finance, Development and Reform Commission and the National Energy Board jointly set up a renewable energy development fund, the funds mainly came from the national financial public budget arrangements for special funds and levied to the electricity users for renewable energy price additional income according to the law, which mainly used to support renewable energy power generation and development and utilization activities.

**Tax policy**

Tax policy, including a series of preferential tax incentives, mainly included value-added tax incentives, import links value-added tax and tariff concessions, consumption tax incentives, corporate income tax incentives and other tax incentives. Take value-added tax incentives for example, in 2008, the taxpayer sales of self-produced wind power to achieve the value-added tax that is 50% returned. Sales of self-produced biodiesel and garbage as fuel production of electricity and heat, achieved Value-added tax that immediate levied and refunded totally. From October 2013 to the end of 2015, taxpayers who used solar energy to produce new energy and electricity could enjoy half of the value-added tax in sales. In addition to VAT concessions, tax rates were set at tax rates, for example, 13% tax rate was for sales or import of biogas. As to other tax concessions, China exempted from energy travel and new energy vehicles travel tax since 2012.

**Existing problems of fiscal and taxation policies**

The rapid development of new energy sources benefited from the government's policy guidance and financial support, but from process of the new energy development, there existed some of the phenomena, such as abandoning the wind and light energy, backward technology, small new energy companies financing problems and excess capacity, There are still many problems in the current fiscal and taxation policy.

**Fiscal and taxation policy system is not systematic**

The current fiscal and taxation policies are formulated in line with the strategic planning and objectives of the relevant national new energy sources. The initial fiscal and taxation policy framework is also lacking in completeness and systematization. First of all, most of the current fiscal policy were mainly for wind energy, solar energy and biomass energy. While the ocean and geothermal energy in China, the distribution and use are very broad, but less policy were for the two. Secondly, through the policy analysis, it was not difficult to find that the current tax policy were limited to turnover tax and corporate income tax, preferential methods were mostly tax-free and tax cuts, which were lack of investment credit, reinvestment tax rebates, deferred taxation, etc., the impact of tax policy leverage were affected and weakened the tax in the field of new energy regulation capacity.
Lack of coherence in the role of fiscal and taxation policies

New energy development has its inherent stages and rules, which can be divided into research and development stage, investment stage, production stage and consumption stage. Due to lack of professional division for the new energy development of the various stages, leading to the introduction of government policies cannot meet the specific stage of development of new energy needs, resulting in lack of links and lack of policy.

Fiscal and tax policy was lack of relevance and applicability

The original intention of many current fiscal and taxation policy design was good, but they failed to fully take into account of the actual situation of new energy development, often difficult to play a real effect as a result. For example, there were many meticulous norms among the new energy technology research and development incentives such as the independent intellectual property rights, technical documents, installed capacity and product certification.

Lack of restrictive tax policy

Tax incentives can directly promote the development and utilization of new energy, in turn, the implementation of restrictive taxation of traditional energy can also indirectly reflect the support of new energy. From the point of view of China's current tax policy settings, there still lack of similar policies relatively.

Over-protection of fiscal and taxation policies

Fiscal and taxation policy create a growth space for enterprises which need great investment, high cost, but long-term protection policy could also promote the dependence of enterprises, so that enterprises lose their sense of innovation, their development capacity is weak, technological progress was slow, and lack of international competitiveness.

Fiscal policy to improve the new energy

To improve the system and effectiveness, fiscal policy should focus on the following two aspects. On the one hand, in the policy design, the new energy companies and new energy products should link to the life cycle, so that policies can cover all aspects of the development of new energy sources, and tilt to the R&D and consumption links. On the other hand, most of the fiscal policy issued to the new energy companies were in the form of funds, to focus on ensuring the qualification and funding in the process of timeliness and fairness issues, improve efficiency, strengthen supervision, so as to make sure that policy really implemented.

R & D Fiscal Policy

Technology is the core to promote the development of new energy, we should target research and development subsidies according to the development of different new energy companies and the development of the characteristics.
**Investment Link Fiscal Policy**

Investment subsidies are mainly divided into direct subsidies and loan discounts. Subsidies can directly mobilize the enthusiasm of investors, which is able to quickly play a policy effect in short-term generally, which is currently using a more common way in China, and mostly in the construction of new energy projects receive the subsidies in accordance with the installed capacity. In the fast energy consumption today, energy storage technology as a smart grid, new energy access, distributed power generation and new energy vehicle development essential support technology, has a wide range of application prospects, which is an important part China should pay fully attention to.

**Production sector Fiscal policy**

Production links subsidies in China is mainly new energy power tariff subsidies. Since the implementation of the policy, it indeed made up for the cost of new energy companies and achieved the purpose of increasing production. In the policy improvement should pay attention to the fact that subsidies should not become the only way for enterprises to survive. Future policies should be more able to mobilize the enterprise's innovation and production initiative, so that enterprises can improve their own strength in the competition to win. China can follow the example of Germany, with the cost of the equipment manufacturing technology mature and power generation went down, subsidies should decrease timely to avoid over-protection.

**Consumer Link Fiscal Policy**

Marketing and consumption is another important part of the development of new energy, and to limit the scope of the promotion of new energy is mainly due to the high cost of new energy products. Government should increase the consumption of policy efforts, on the one hand they should compensate the interests of consumers, on the other hand the government play the role of the guiding effect and multiplier effect, leading the market consumption trends, which can also effectively alleviate the phenomenon of excess energy in the field of new energy.

**Optimize the new energy tax policy system**

Relative to the financial subsidies, tax policy implementation costs are lower, which is widely used internationally as a special financial expenditure. China's tax policy should focus on the combination of incentive policies and restrictive policies, the combination of direct and indirect policies, and the development of more tax incentives to cover the entire new energy industry chain.

**Improve the existing incentive tax policy**

VAT. The current value-added tax concessions for the production of new energy products are also relatively fragmented. The concession objects contain only some part of the new energy products, such as the biomass industry, returning only the value-added tax on biodiesel and garbage generation. (2) Tariffs. China's new energy industry in some areas of the R&D level is still relatively low, the lack of core technology, a lot
of technology and equipment also rely on imports. Therefore, it should continue to reduce the key components of new energy equipment import and export taxes. (3) Corporate income tax. China's corporate income tax concessions still lack the use of this indirect policy of tax credit. The advantage of investment credit is to mobilize enterprises to increase investment in equipment, innovation and technological innovation, to achieve a virtuous circle, reducing the financial pressure on the policy at the same time.

**Sound restrictive tax policy**

Speed up the environmental protection tax legislation. Environmental taxes are widely recognized and implemented in the world. It internalize the additional costs of managing environmental pollution and break through the ecology, increasing the cost of production and market prices by enterprises, so that enterprises can update their technology or reduce the scale of production so as to reduce production discharge of pollutants.

Improve the current consumption tax. Firstly, to expand the scope of the collection of consumption tax, coal, natural gas and other highly polluting energy products into the consumption tax items. Secondly, continue to improve the existing tax items in gasoline, diesel and other power fuel consumption tax rate, increase taxes and taxes accounted for the proportion of oil prices, and gradually eliminate the traditional energy prices’ advantage relative to bio-fuels, prompting consumers to actively consume new energy products.

**CONCLUSION**

Energy is vital to the development of a country. This paper focuses on the analysis of China's new energy development fiscal policy, and gives the relevant policy recommendations. China's energy development is superior to the world average, but there is still a gap with the developed countries in the world. The concrete manifestation is that the distribution of energy structure is irrational, the contradiction of energy type is prominent, the per capita energy resources are relatively insufficient, and the energy efficiency is not high and so on. At the same time, there also exist problems, such as the core technology holding rate is low, high cost of low production and the prevalence of policies and regulations to be further improved. Finally, this paper analyzes the current fiscal and taxation policies, existing problems and further suggestions of China's new energy fiscal policies.

**REFERENCES**

