# Several Key Issues that Need to be Addressed Urgently in Gansu Province's Successful Realization of the "Dual Carbon" Goal

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**Abstract:** Gansu is an important energy base in China and an important ecological security barrier in Western China. It has significant advantages in resources, location and channel, and has the favorable conditions of base, scale and integrated development, which is the key for the province to promote the green and low-carbon transformation of energy, achieve the goal of "dual carbon" on schedule and cultivate new economic pillar industries. The proposal of China's "dual carbon" goal in the new era has important strategic significance for the province to serve and integrate into the new development pattern, seize a new round of scientific and technological revolution, and promote the "green rise" of the economy. In order to seize new opportunities and promote the smooth realization of the "dual carbon" goal, Gansu Province should deal with the following issues.

**Keywords:** Dual carbon; Green development; New energy; Gansu province

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**Author Introduction:** Guofeng Zhao (1993, 06), male, Gansu, Han nationality, postgraduate, master, no title, main research directions: carbon peaking, carbon neutrality, industrial economy, political economy, etc.

## 1. Preface

On September 22, 2020, at the General Debate of the 75th Session United Nations General Assembly, President Xi Jinping solemnly announced to the world that China "strive to reach the peak of carbon dioxide emissions by 2030 and strive to achieve carbon neutrality by 2060". This goal will realize China's revolution in the energy field, which will not only reshape China's energy structure, but also have a positive impact on the economy, bringing digital transformation and intelligent applications.

## 2. Make Full Use of Abundant Clean Energy and Seize Development Opportunities

To achieve carbon neutrality in China is to build a cleaner, safer and more efficient energy structure. In the long run, carbon neutrality will accomplish the strategic goal of energy revolution proposed in the Beautiful China Ruling Idea. According to the forecast of future development, if non-fossil energy-based electricity will become the main energy source in primary energy resources, and the electrification rate in energy consumption will reach 100%, hydrogen energy in secondary energy resources can reach 30%, net-zero emissions will eventually be achieved.

China has long advocated energy conservation and energy security, but China's energy structure is "rich in coal, lacking in oil and gas", so oil and gas resources are relatively scarce. Energy security has always been a major issue that needs to be considered in China's development. If the large-scale application of renewable energy is realized to cross the era of oil and gas energy, it is expected to improve our country's energy independence, change the structure of energy production and distribution, and ultimately make energy consumption no longer restricted, and comprehensively improve social and economic development capabilities and people's living level [1].

As shown in Figure 1, the distribution of solar energy resources in China is mainly concentrated in the northern and western regions. There are mainly three regions with abundant wind energy resources. The first region is the "Southeast Coastal Area", China has a long continental coastline, with a length of over 18,000 kilometers. The second region is the "Northeast and Northwest Region", Liaoning, Jilin and the western part of Heilongjiang in northeast China, as well as the whole territory of Inner Mongolia in northwest China, plus the eastern part of Xinjiang, which are the regions with the most abundant

wind energy resources in our country. The third region is the "northwest Qinghai-Tibet Region". Considering that photovoltaics in the western desert area has a characteristic of attenuation effect slowing down due to less water vapor, this shows a certain ecological efficiency in practice, if the desert Gobi, which occupies 9% of the country's land area, is fully utilized, it can support 20,000 GW installed capacity of newly added photovoltaic power generation. By the end of 2021, China has built 306 million kilowatts of solar power generation installed capacity and 328 million kilowatts of wind power generation installed capacity, and about 100 million kilowatts of photovoltaic power generation capacity is currently under construction in desert areas. According to the current plan, only in the desert Gobi area, a new generation installed capacity of 450 million kilowatts of wind power and photovoltaic power will be built. Our current goal is to increase the total installed capacity of wind power and photovoltaic power generation in our country to at least 1.2 billion kilowatts by 2030, so that to make the proportion of clean electric energy in China' power generation mode larger than at present, and contribute strength and value to China's sustainable economic development, the construction of a good natural environment, and the goals of carbon neutrality and carbon emission reduction.

Standing in front of the overall strategic situation of the whole country, Gansu is right in the gathering area of light and wind energy, both of which are rich, and it is one of the regions with the best basic conditions for developing new energy in China. The Gansu Provincial Government seized the opportunity and pointed out in Gansu Province's 14th Five-Year Plan and the Outline of 2035 Long-Range Objectives that new energy should be vigorously developed. Adhere to the combination of centralized and distributed power generation, and the combination of power transmission and on-site consumption; Strive to increase the supply of non-fossil energy such as wind power, photovoltaic power generation, solar thermal power generation, and pumped storage power generation; Then form an integrated and coordinated development pattern of wind, light, water, fire and storage. However, in the specific implementation, it is necessary to strengthen the understanding of the following issues:

**2.1 Stick to the Overall Situation of Development and Prevent the Emergence of Sectionalism**

Wind and solar power generation has been developing for 40 years, and it is indeed developing very well, but China's wind and solar power generation so far is equivalent to 192 million tons of standard coal power generation, while China's total power generation needs 2.2 billion tons of standard coal. In this case, there has also been problems of abandoning solar energy or wind energy. Why does abandoning solar energy and wind energy occur? Because wind energy and solar energy are unstable energy sources, when some power grids have 15% of unstable energy sources, the power supply pressure will be relatively large, which may cause large-scale power outages. At the technical level, the stability of wind energy and solar energy has many limitations compared to thermal power generation. How can we realize energy storage to ensure the stability of this energy supply? This technical problem needs to be solved. In the process of local development, they will definitely face such problems, actively solve them, and do a good job in

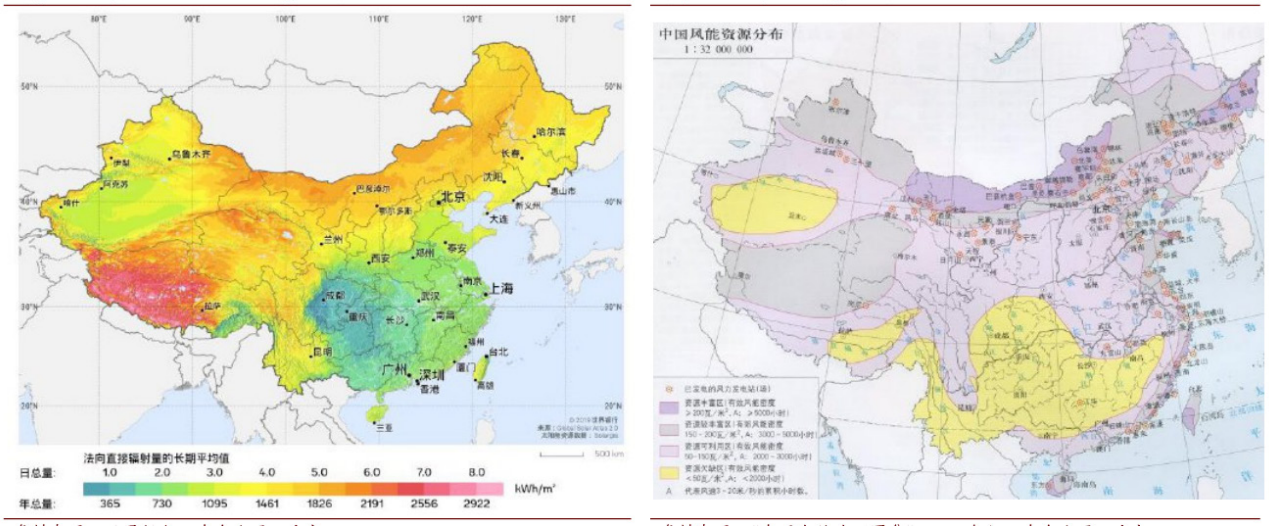


**Figure 1.** Distribution of solar energy and wind energy in China

supervision is an important guarantee for the realization of transformation. In the era of new energy development, Gansu Province has an important opportunity to achieve transcendence. It is necessary to guarantee strong supervision, and prevent local governments from considering short-term GDP growth or lack of innovation ability and other factors that lead to the problem of abandoning solar energy and abandoning wind energy [2].

### 2.2 Improve Innovation Ability and Solve Electricity Storage Problems

Since the invention of lead-acid batteries in 1858, human beings have invested a lot of money and energy in research and development in more than 100 years. Our entire energy storage capacity has increased from 90 kWh per cubic meter of lead-acid batteries to Tesla's 260 kWh per cubic meter nowadays, but we saw that more than 20 years after the invention of the lead-acid battery, the internal combustion engine was invented. The gasoline is 8600, and the diesel is 9600. Therefore, the orientation of our policy in the future is one aspect, and there is a market orientation in the other aspect. To promote the realization of our goals, these technical difficulties are the first to be broken through. Gansu is rich in wind and light resources, if it strengthens innovative research and development and solves practical problems through provincial and international cooperation, this will be of great significance for the future leap-forward development.

## 3. To Achieve High-quality Development, Talent Reserve is the Key

The realization of China's "dual carbon goals" is inseparable from the green transformation of economic and social development and the adjustment of industrial structure. Technological innovation is an important support for industrial structure adjustment and high-quality economic development, which requires the cultivation of a large number of relevant talents. China has a tight schedule and a heavy task to achieve the "peak carbon dioxide emissions and carbon neutrality", talents play a vital role in the realization of the "dual carbon" goal. Implementing the "dual carbon" goal requires cultivating high-quality talents, and requires in-depth integration of "developing science and technology as the primary productive force, cultivating talents as the primary resource, and enhancing innovation as the primary driving power", promotes carbon neutrality and domestic and foreign cooperation and exchange activities, develops domestic and foreign cooperation and exchange activities, and researches on cooperation strategies to jointly build a green "Belt and Road", and cultivate compound, professional and innovative talents.

However, from 2010 to 2020, Gansu lost nearly 555,400 people due to negative population growth. From 2020 to 2021, Gansu's population decreased by 110,000 people, which was twice the average of the previous 10 years, as shown in Figure 1. Before the outbreak of the epidemic, the ranks of Gansu college students developing to the southeast of China are becoming larger and larger. According to statistics, more than 60% of the fresh graduates from Lanzhou Jiaotong University, Lanzhou University of Finance and Economics and other colleges and universities hopes to work in the southeastern coastal cities, while only 40% of college students studying in other provinces and cities from Gansu province can return to their hometown.

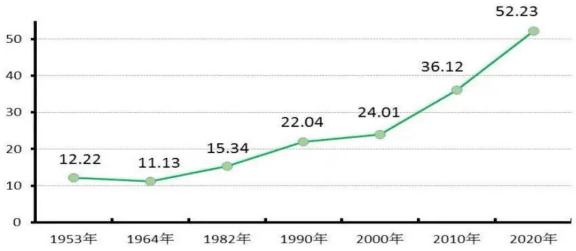


**Figure 2.** The census of Gansu Province

Therefore, considering the future development of Gansu, we should pay more attention to the construction of talents:

1) Relying on the universities in Gansu, accelerate the innovation and cooperation with domestic and international universities, and strengthen the training of innovative talents in emission reduction, especially the cultivation of related professionals in energy storage and hydrogen energy, reserve talents for achieving Gansu's net emission reduction target.

2) Resolutely implement the talent introduction policy, formulate and update the talent introduction policy at different levels, benchmark Hangzhou, Shanghai, Chengdu and other places, focus on ensuring the living and working environment of the introduced talents in Gansu, and improve the financial support for the introduction of talents, especially the housing and treatment issues, so as to solve the problem of talent retention in innovative development [3].

## 4. Strengthen the Construction of Green Infrastructure and be at the Forefront of Green Development

With the proposed carbon neutrality goal, the direction of China's future energy transition development has been

very determined. From the supply-side, carbon emission reduction is equivalent to another supply-side reform. The opportunity for new energy investment lies not only in the growth of traditional manufacturing, but also in the birth of new business models or new technology application opportunities; From the demand side, the carbon neutrality goal is expected to bring about the rise of new markets, and force the green transformation of the industrial chain by changing the way of consumption. Gansu is rich in new energy resources and plays an important role in the future transformation and development. Only by seizing opportunities for green development can we be at the forefront of development.

**4.1 Make Good Use of Resource Advantages and Develop Green Buildings**

In 2021, China released the "Implementation Plan for Promoting Green Consumption" to force the green transformation of the industrial chain by changing the way of consumption. Many future green and low-carbon implementation projects have been proposed, such as the green building model, accelerating the development of green construction, and promoting the scale development of green buildings and low-carbon buildings, and incorporating energy-saving and environmental protection requirements into the renovation of old communities. In the future, under the high proportion of renewable energy structure, new building power distribution and consumption should have four new technologies — light, storage, direct, flexible. Among them, "light" and "storage" refer to distributed photovoltaics and distributed energy storage, which will be increasingly used in building scenarios, as an important part of building power distribution and consumption systems; "direct" refers to the change in the form of building distribution network, from traditional AC distribution network to low-voltage DC distribution network; "flexible" means that building electrical equipment should have the ability to be interrupted and adjustable, so that building electricity demand changes from rigid to flexible. Gansu must keep up with policies, be at the forefront of development, deploy as soon as possible, and incorporate the concept of green development into the renovation of old communities, the development of new buildings and new environmentally friendly building materials, seize the opportunity to achieve the goal of net emission reduction and improve green competitiveness.

**4.2 Vigorously Develop New Energy Transportation Tools**

General Secretary Xi Jinping pointed out: "The development of new energy vehicles is the only way for our country to move from a big automobile country to a powerful automobile country". The "Thirteenth Five-Year Plan" period is the five years of the great development of China's new energy vehicle industry, and indicators such as output, sales, holdings and the number of charging piles have ranked first in the world. China has established a complete industrial system, mastered core technologies such as batteries, motors, and electronic controls, and has significant competitive advantages in terms of market scale, whole vehicle manufacturing, industrial support, industrial policies, and infrastructure construction, China has become a leader in the global new energy automobile industry. By replacing existing fuel vehicles with electric vehicles, clean traffic will be realized, which will reduce the carbon emissions caused by gasoline and diesel combustion during traffic travel. According to the State Council's "New Energy Vehicle Industry Development Plan (2021-2035)", in 2025, our country's new energy vehicles will account for 20% of new car sales, and by 2030 and 2035, this proportion will further increase to 40% and 50%. Now the world' new energy vehicle companies, including Mercedes-Benz, BMW, BYD, etc., have announced that they will stop the production of fuel vehicles at a certain point in the future. Most of the domestic car companies in China will stop selling fuel vehicles in 2025. Most of the companies will be after 2030 [4].

In July 2022, at the 28th China Lanzhou Investment and Trade Fair, electric buses that "Made in Lanzhou" successfully entered the German market, becoming the single largest order for domestic electric buses to be exported to Germany. Gansu must seize the opportunity to improve the new energy vehicle industry chain in Gansu Province, and make it an international industrial highland for the research and development, manufacturing and export of new energy vehicles.

In Gansu Province, 100% of buses are to be electrified, and only some private cars are fuel vehicles. In order to speed up the cleanliness of transportation, Gansu Province should vigorously promote the construction of charging facilities in public parking lots, develop the integrated construction of light charging and storage charging, introduce preferential policies for electric vehicles, and encourage park residents to buy electric vehicles and retire fuel vehicles. In 2025, the number of fuel vehicles will be reduced to 60% of the existing number; in 2030, the number of fuel vehicles will be reduced to 15% of the existing number, and by 2045, the transportation in the park will be clean and 100% clean energy vehicles will be realized. In this process, policy support and technological innovation should be strengthened to ensure that specific

goals are completed at specific time points.

By developing green buildings, formulating energy efficiency management measures and vigorously developing green transportation and other measures, Gansu will be able to realize the transformation of resource advantages + innovative development in the process of implementing the "dual carbon" goal, and profoundly change the present situation of Gansu's economic development.

## 5. Pay More Attention to Ecological Security Construction and Realize Carbon Sink Benefits

Gansu is located in the inland of the motherland and belongs to the three major river basins of the Yangtze River, the Yellow River and the Inland River. It undertakes important ecological functions such as water supply, water conservation of major rivers, windbreak and sand fixation, and biodiversity protection in the country. Gansu is an important ecological security barrier in western China. Rich ecological landforms and natural resources give Gansu more possibilities to achieve carbon neutrality. Among them, relying on the existing achievements in ecological protection of the Qilian Mountain, as well as through afforestation, vegetation restoration and other measures, absorb carbon dioxide in the atmosphere, thereby reducing the concentration of greenhouse gases in the atmosphere, creating a carbon sink system, and becoming important means to achieve the goal of carbon neutrality. For the carbon sink system, Gansu needs to start from three aspects: forest carbon sink, grassland carbon sink and water carbon sink.

1) Forest carbon sink refers to the process in which forest plants absorb and fix carbon dioxide in the atmosphere into vegetation and soil through photosynthesis, thereby reducing the concentration of carbon dioxide in the atmosphere. Forestry industry carbon sink refers to using the carbon storage function of forests to absorb and fix carbon dioxide in the atmosphere through activities such as afforestation, strengthening forest management, reducing deforestation, protecting and restoring forest vegetation.

2) The grassland carbon sink mainly refers to fixing the absorbed carbon dioxide in the underground soil. The carbon sequestration ratio of plants is relatively small, accounting for only about 10%. The carbon sequestration ability of perennial herbs is stronger. With the implementation of the project of returning farmland to forest and grassland in China, especially the increment of carbon sequestration in degraded grassland is more obvious, so it can give full play to the role of carbon sequestration in grassland.

3) Water carbon sink is the process and mechanism of taking rivers and lakes as a specific carrier to absorb carbon dioxide from the atmosphere and solidify it. More than half of the biological carbon and green carbon on earth is captured by aquatic organisms (plankton, bacteria, seagrass, salt marsh plants and mangroves), and wetlands (such as Zhangye's wetlands), lakes etc. in Gansu, can increase carbon sink by planting submerged plants and water-rich plants.

## 6. The Gansu Provincial Government Should Strengthen Multi-party Cooperation and Do a Good Job in Publicity and Guidance

Gansu province should publicize the application of various low-carbon energy-saving technologies and ways of production and living organization from time to time through various media organizations, to build a green, low-carbon and beautiful low-carbon development model in Gansu. At the same time, through the opening of columns, award-winning essays, etc., timely publicize the task deployment of low-carbon development programs by the nation, Gansu Province, local cities and states, etc., and give all kinds of subjects the right to suggest the development of low-carbon life; hold high-level domestic and international forums on low-carbon development and new power systems, strengthen international exchanges and cooperation, advocate the concept of energy transformation and green development, fully implement the concept of sustainable development, further promote sustainable management, support the integration of the national dual-carbon strategy into the global discourse system; Strive to form an international guide to demonstrate and promote green development in underdeveloped areas in northwest China; Strengthen information disclosure and external publicity, actively conduct discussions and exchanges with similar regions, industry enterprises, and scientific research institutes, exchange knowledge, brainstorm ideas, and gather a strong synergy to promote low-carbon development.

### 6.1 Establish the Concept of Green and Low-carbon Consumption Life

Regularly carry out green life creation activities, advocate a simple, moderate, green and low-carbon production and lifestyle, and cultivate green, healthy and safe consumption habits; Adhere to updating the concept, laying a solid foundation, advocating saving priority and green consumption, strengthen the concept of green lifestyle for the whole people year by year; Gradually establish an encouragement and guidance system for green lifestyle,

and continuously enhancing the public's internal motivation to practice green life; Build a fast and convenient social green product service system, promote the public to develop the habit of green lifestyle. Finally realize the transformation of the whole society's lifestyle and consumption pattern to the direction of diligence, thrift, green and low carbon, civilization and health; and form a new social trend of advocating ecological civilization for everyone, everything and all the time. Through various guiding measures, improve the environmental awareness and green consumption knowledge level of the whole people, publicize and implement the concept of green ecology in the details of life, and enhance the green consumption awareness of the whole society [5].

### 6.2 Build a Green, Low-carbon and Circular Development System

Advocate the concept of green, low-carbon and circular development, give full play to resource advantages and geographical advantages, do a good job in adjusting the pattern of interests, optimize the industrial organization structure, improve the concentration of high-tech industries, and form a development pattern of "each with its own characteristics, resource sharing, industrial integration, mutual benefit and win-win". Introduce incentive policies to support waste heat recovery and cascade utilization of industrial water in the industrial field, encourage the application of recycling low-carbon technologies such as rainwater collection and natural light gathering lighting in the field of low-carbon buildings, open up the recycling industry, insist on the garbage classification, and efficiently implement waste recycling.

Assist enterprises to carry out foreign cooperation, build a green supply chain, encourage enterprises to carry out green design, select green materials, implement green procurement, create green manufacturing processes, implement green packaging, carry out green transportation, and do a good job in recycling waste products, so as to realize green environmental protection in the whole product cycle. It is necessary to increase fiscal and taxation support, vigorously develop green finance, develop green credit and green direct financing, develop green insurance, give play to the role of the insurance rate adjustment mechanism, and support qualified green industry enterprises for listing and financing.

## References

[1] Fan, Y.X., Wei, F., 2022. Contributions of Natural Carbon Sink Capacity and Carbon Neutrality in the Context of Net-Zero Carbon Cities: A Case Study of Hangzhou. Sustainability. 14(5).

[2] Seto Karen, C., Churkina, G., Hsu, A., et al., 2021. From Low- to Net-Zero Carbon Cities: The Next Global Agenda. Annual Review of Environment and Resources. 46.

[3] Francesco, F.N., Adriaan, S., Rebecka, E.E., et al., 2019. A Research and Innovation Agenda for Zero-Emission European Cities. Sustainability. 11(6).

[4] Xu, M.M., Lin, B.Q., 2022. Towards low-carbon economy by carbon label?: Survey evidence from first-tier cities in China. Environmental Impact Assessment Review. 97.

[5] Zhang, J.N., Lyu, Y.W., Li, Y.T., et al., 2022. Digital economy: An innovation driving factor for low-carbon development. Environmental Impact Assessment Review. 96.