

White Paper on Clean Energy Cooperation between China and Central & Eastern European Countries

(For CEECs)

November 2021

China—Central and Eastern Europe Countries Center
for Dialogue and Cooperation on Energy Projects

Preface

Central and Eastern Europe (CEE) is an important partner of China along the Belt and Road routes. In 2012, the two sides jointly launched China—CEEC cooperation mechanism. Since the establishment of this mechanism, leaders of China and CEE countries have held many meetings and achieved a series of guidelines and outcomes, expanding China—CEEC cooperation to an increasingly wide range of areas with more contents and more types of activities. The cooperation has maintained a sound development momentum. In the field of energy, enterprises of the two sides have carried out extensive pragmatic cooperation in the engineering and construction of large-scale power projects, investment in new energy, acquisitions and mergers of enterprises, etc., which has brought tangible environmental, social and economic benefits to both sides.

In order to implement The Suzhou Guidelines, the outcome of the 4th China—CEEC Summit, the China—CEEC Center for Dialogue and Cooperation of Energy Projects (hereinafter referred to as "17 + 1" Energy Center) was formally established in October 2016, with the Chinese secretariat located in China Electric Power Planning and Engineering Institute and the European secretariat located in Romanian Energy Center. At present, the work of "17 + 1" Energy Center mainly focuses on three areas: firstly, promoting multi-level exchanges and dialogues between China and CEEC; secondly, conducting researches on energy cooperation plans and roadmaps between China and CEEC; and thirdly, promoting pragmatic cooperation between enterprises from China and CEEC in the energy sector.

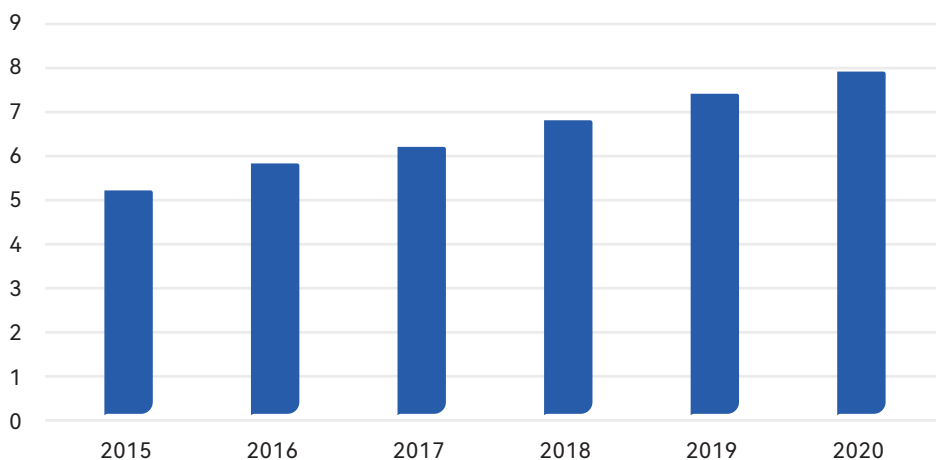
As for implementing the outcomes of the 2021 China—CEEC Summit and promoting pragmatic cooperation between enterprises from both sides in the field of clean energy, China's National Energy Administration will hold the 2nd China—CEEC Energy Cooperation Forum for Enterprises on November 10, 2021. As the organizer of this forum, China—CEEC Center for Dialogue and Cooperation on Energy Projects will release White Paper on Clean Energy Cooperation between China and Central & Eastern Europe Countries during the forum, aiming to provide a reference for enterprises of both sides to carry out comprehensive exchanges and pragmatic cooperation in the field of clean energy, and promote the high-quality development of clean energy cooperation between China and CECC.

1 Current Situation of Clean Energy Development in China

China's transformation of clean and low-carbon energy continues to accelerate. The "double control" system of total energy consumption and intensity has been strictly implemented. During the 13th Five Year Plan period, the total energy consumption had been controlled within 5 billion tons of standard coal, with an average annual growth rate of 2.8%, ensuring healthy economic development with a low growth rate. The energy consumption structure continues to be optimized. The share of clean energy in the increment of energy consumption increased to more than 65%, and the proportion of non-fossil energy consumption increased to 15.9%. In 2020, the total installed capacity of electric power was about 2.2 billion kW. The average annual growth rate during the 13th Five Year Plan period kept at about 7.5%. The installed power structure has been continuously optimized. In 2020, the proportion of installed coal power was reduced to 49.1%, around ten percentage points lower than that in 2015. The proportion of installed non-fossil energy power generation reached 44.7%, about ten percentage points higher than in 2015.

China's Clean Energy Consumption from 2015 to 2020

Unit: 100 Million Standard Coal

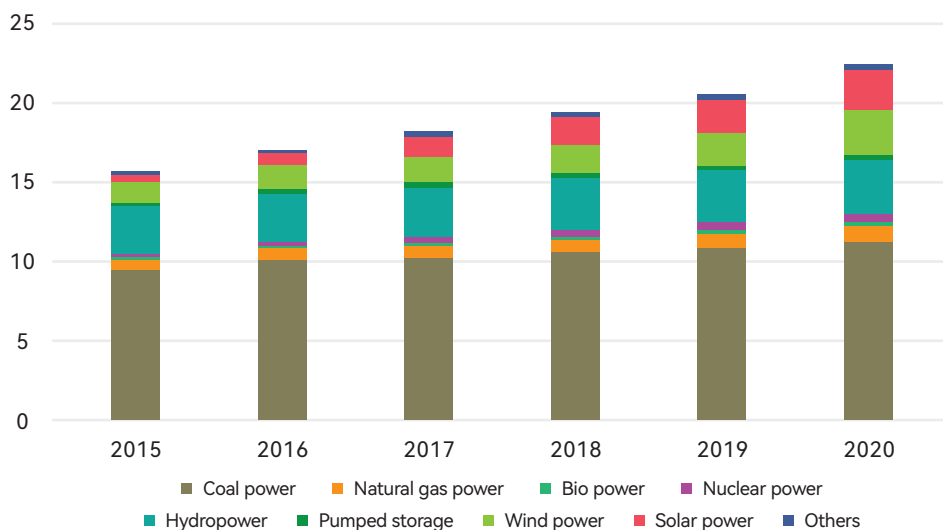


Data source: China Energy Development Report 2020

The scale of clean energy development and utilization has expanded rapidly. During the 13th Five Year Plan period, the production capacity of hydropower, nuclear power, wind power and solar power increased steadily, and the installed proportion of non-fossil energy power generation increased continuously. In 2020, the installed proportion of non-fossil energy power generation reached 44.7%. In 2020, the total installed capacity of wind power arrived at 2.8 million kW, and the annual installed capacity rose by 72.38 million kW, a year-on-year increase of 34.6%. The total installed capacity of photovoltaic power generation reached 2.5 million kW, and the annual installed capacity increased by 49.25 million kW, a year-on-year increase of 24.1%. The total installed capacity of nuclear power reached 49.89 million kW, accounting for 2.3% of the total installed capacity of power sources in China and 5.2% of the total installed capacity of non-fossil power sources in China.

China installed capacity of power sources 2015-2020

Installed capacity of electric power (Unit: 100 million kW)



Data source: National Energy Administration (NEA)

Photovoltaic and onshore wind power projects have fully entered the era of grid parity. With the progress of industrial technology and the improvement of efficiency, the cost of new photovoltaic power generation projects and wind power projects has been declining in recent years. At present, the conditions for affordable access have been met. From 2021, the newly approved photovoltaic and onshore wind power projects will no longer enjoy subsidies. The on-grid price of new energy projects in 2021 shall be made according to the local benchmark price of coal-fired power generation. New projects can voluntarily set on-grid prices by participating in market-oriented transactions so as to better reflect the green value of photovoltaic power generation and wind power. The on-grid price of offshore wind power and solar thermal power generation can be set through competitive allocation.

Clean Energy Cooperation Foundation

▶ **Project construction cooperation:** The advantages of Chinese enterprises in clean energy project design, equipment manufacturing and factor integration have been recognized by local investors. In recent years, Chinese enterprises have participated in more diversified projects in CEE, especially in emerging fields such as offshore wind power, photovoltaic, solar thermal power generation and biomass power generation. Projects such as the Minos Solar Power Project built by China in Greece have vigorously promoted the clean energy cooperation between China and CEEC.

▶ **Energy project investment cooperation:** Wind power and the photovoltaic industry have become the main areas of greenfield investment by Chinese enterprises in CEE. In recent years, Chinese enterprises have made breakthroughs in its invested large-scale wind power and photovoltaic projects, such as the wind power project financed by NORINCO International in Senj, Croatia, and the wind power project by Shanghai Power in Mozura, Montenegro, which has effectively promoted the in-depth integration of clean energy industry chains of both sides.

▶ **Technical exchange activities:** Taking the "17 + 1" energy center as an essential platform, China and CEEC jointly held a series of technical exchange activities in the energy field, including the First 16 + 1 Energy Fair and Conference in 2017, the First Technology Conference On China—CEEC Energy Cooperation in 2018, and the China—CEEC Energy Cooperation Forum in 2019. These activities effectively promoted exchanges and collaboration between governments, enterprises, financial institutions and think tanks of both sides.

► **Think tank cooperation:** In 2020, China Electric Power Planning & Engineering Institute and China—CEEC Center for Dialogue and Cooperation on Energy Projects jointly compiled and released Report on Energy Cooperation Between China and CEEC. As the first research on China—CEEC energy cooperation in the industry, the report focused on the current situation and future energy development trends in CEE and provided a reference for more targeted and pragmatical cooperation between China and CEE.

2 Development Prospects of Clean Energy in China

China vigorously promotes energy transformation and sustainable development. The Action Plan for Carbon Dioxide Peaking before 2030 points out that by 2030, the proportion of non-fossil energy consumption will occupy about 25%, and the carbon dioxide emission per unit of GDP will be reduced by more than 65% compared with that in 2005. China will successfully achieve the goal of reaching the carbon peak by 2030. New energy will be vigorously developed, and the large-scale exploitation and high-quality development of wind and solar power generation will be comprehensively promoted. By 2030, the total installed capacity of wind and solar power generation will reach more than 1.2 billion kW.

The development of wind power enters a period of rapid growth. In order to support the realization of the strategic goal of "carbon peaking and carbon neutralization" and accelerate the construction of a new power system with new energy as the main body, China will further accelerate the development and utilization of new energy such as wind power. With the progress of technology and the decline of equipment cost, the economy of wind power project development has been further improved, and onshore wind power has fully entered the era of equal- and low-price access and market-oriented development. In some areas with good wind resources, onshore wind power will further bid based on grid parity to realize the low on-grid price. With the accelerated implementation of intensive development projects (including the integration of supply, grid, and load and storage, the multi-energy complementary system), and the offshore wind power generation, wind power development is expected to further accelerate based on the average level of the 13th Five Year Plan. According to China Power Development Report 2020, the total installed capacity of new wind power from 2021 to 2023 will increase by about 130 million kW.

The development of photovoltaic power generation will further accelerate. The policy support for developing and utilizing new energy such as photovoltaic power generation will continue to improve. Due to the considerable demand for land for photovoltaic power generation, the development and distribution of centralized photovoltaic power stations in the future are expected to be mainly in the North, Northeast and Northwest of China, while the distributed photovoltaic development will become an important choice in the Mideast and the South of China. In the newly increased installed capacity of photovoltaic power generation in 2020, centralized PV accounts for 68% and distributed PV accounts for 32%. It is expected that distributed PV will continue to show good momentum in the future. According to China Power Development Report 2020, it is estimated that the total installed capacity of new photovoltaic from 2021 to 2023 will increase by about 170 million kW.

3 Focus Areas and Pragmatic Actions

Photovoltaic power generation

CEE is rich in photovoltaic resources, and photovoltaic power generation has great cost advantages, so CEE has a great potential to develop photovoltaic power stations in the future. China, as a global production base for photovoltaic equipment and a country with the largest investment in photovoltaic power plants, has advanced technology and equipment advantages in centralized photovoltaic power plants and distributed photovoltaic power plants. Enterprises of both sides can cooperate in investment and construction of photovoltaic power station projects, equipment manufacturing, technical services and so on.

Wind power

Most areas in CEE are sub-optimal areas of wind resources, which are similar to low wind speed areas in eastern and central China, and have certain development potential. China has accumulated rich experience in the development of low-wind-speed wind power, and established a complete equipment product line for operation in low wind speed environments. Enterprises of the two sides can cooperate in investment, construction and equipment of onshore low-wind-speed wind power projects. The Baltic Sea region is rich in wind energy resources, with huge potential for market development. China has advanced technology and rich experience in developing offshore wind power, especially in the manufacturing of large-capacity wind turbines and the offshore wind power construction. The two sides can cooperate in the fields of offshore wind power project investment, equipment manufacturing and project construction.

Emerging technology areas

Energy storage is an important equipment foundation and key supporting technology to realize the green and low-carbon transformation of energy. With the increasing market share of intermittent renewable energy power, energy storage will play an important role in ensuring power system stability. Installation of energy storage devices for existing power grids and new energy power plants will help realize the large-scale development and utilization of new energy. China has significant technical strength in new energy storage and has significant advantages in the whole industrial chain from material preparation to system integration. CEE countries have emerging technologies in clean energy that can also be applied and promoted in the Chinese market. Enterprises of both sides can carry out in-depth cooperation in R&D and innovation of emerging technologies, as well as investment and construction of energy storage projects, so as to realize the large scale and leveled price of emerging technologies.

Power system with a high proportion of new energy

New energy is significantly different from traditional power sources such as thermal power and hydropower because of its volatility, randomness and intermittence, therefore, the large-scale development of new energy is bound to reshape the power system in all dimensions. For example, the safe and stable operation of the power system will face new risks and uncertainties, the security of the power supply will meet significantly increased difficulties, and the regulation capacity and flexibility of the power system need to be improved. China has advantages of advanced technology in the construction and operation of power system with a high proportion of new energy, and has accumulated rich experience in connecting large-scale new energy to the power system. Enterprises of both sides can cooperate in power systems with a high proportion of new energy and jointly promote relevant work in technology research and development, project development and construction, equipment manufacturing, capacity-building, etc.

A solid blue horizontal bar with rounded ends, positioned on the left side of the page.

White Paper on Clean Energy
Cooperation between China and
Central & Eastern European Countries