

# CLEAN ENERGY COOPERATION BETWEEN CHINA AND CENTRAL & EASTERN EUROPE UNDER THE “BELT AND ROAD” FRAMEWORK: PROSPECTS AND COOPERATIVE PATHS

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**Abstract:** Central and Eastern Europe, in the heartland of Eurasia, is an important region for the mutual construction of the “Belt and Road”, and also a key region for foreign cooperation of China’s energy industry. According to the renewable energy development goals of Central and Eastern European countries, the proportion of non-fossil energy consumption will increase to more than 25% by 2030. The renewable energy will become one of the important routes to achieve energy transformation and clean emissions in Central and Eastern Europe. At present, the proportion of renewable energy consumption in some Central and Eastern European countries is still significantly lower than the EU’s 2030 target; therefore, the pace of energy transformation will be further accelerated. Since China has advanced technology and rich experience in wind power, hydro-power, photovoltaic, nuclear power and other clean energy fields, it can cooperate with Central and Eastern European countries in green energy project development, smart grid, engineering construction, pipe network construction and other fields. The cooperation between the two sides is highly complementary, conforms to the theme of the era of global sustainable development, vigorously promoting the green development of the “Belt and Road”, and consolidating the people-to-people bond of jointly building the “Belt and Road”. This study focuses on the energy development trend of China and Central and Eastern European countries, explores the cooperation paths of the two sides in the energy field, and puts forward targeted reference suggestions for further deepening cooperation between the two sides.

**Keywords:** renewable energy, energy transformation, Central and Eastern Europe

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## 1. Introduction

After entering the 21st century, green economy has become one of the mainstream topics of European concern. In 2010, the EU formally put forward the “three 20 %” targets in the EU 2020 Strategy, namely, reducing emissions by 20 %, increasing renewable energy to 20 % and increasing efficiency to 20%, that is, making resource utilization more efficient, greener and more competitive. In 2019, the European Union launched the European Green Deal, raising the importance of green economy to a new height. The EU has further raised the emission reduction target, increasing the EU emission reduction target from 40 % to 50 % by 2030, and achieving the goals of “climate neutral” and increasing the proportion of renewable energy to 40 % by 2050. Besides, the European Union regards green economy as a new driving force for its future economic and social development. The document clearly states that the “Green New Deal” is a new growth strategy for the transition to a fair and prosperous society. The EU will become an economy with high energy efficiency, strong competitiveness, zero emissions by 2050, and decoupling economic growth from resource consumption. At present, the EU is taking the green economy as an important starting point for economic recovery. 30 % of its multi-year fiscal framework of 1.2 trillion euros from 2021 – 2027 will be used for the transformation of the green economy and the digital economy.

In the transformation and development of green energy, Central and Eastern European countries are among the obvious laggards among EU member countries. First of all, the energy supply of most Central and Eastern European countries is highly dependent on fossil fuels, and the proportion of renewable energy in the energy mix is still a certain distance from the EU’s long-term renewable energy goals (Pakulska, 2021). Secondly, the supply of fossil fuels such as oil and natural gas is heavily dependent on imports from Russia. Since Russia has always used energy as a geopolitical weapon, Central and Eastern European countries have, to varying degrees, taken reducing their excessive dependence on Russia as one of the priorities of their energy policy. Specific measures include expanding other import channels, replacing imported energy with internal energy, and developing renewable energy (International Energy Agency, 2022).

Due to the increase in costs caused by the long transportation distance, the import of oil and gas from third countries other than Russia, such as Norway, Qatar and Kazakhstan, will increase the economic cost of importing fossil energy from Central and Eastern European countries to a certain extent. Central and Eastern European countries have sufficient coal resources, but with the European Commission’s requirement in the European Green Agreement that coal

must be withdrawn from the energy mix of EU countries, the feasibility of using coal to replace imported fossil fuels in Central and Eastern European countries has been hindered (Leonard et al., 2021). In the absence of long-term feasibility of the first two measures, developing clean energy is a favorable way to solve the energy dilemma of Central and Eastern European countries.

Combining various factors, especially the Russian-Uzbekistan conflict in 2022 exacerbated the energy crisis in Europe, and countries in Central and Eastern Europe began to actively deploy clean energy (Table 1). However, the ability of Central and Eastern European countries to achieve climate change goals is uneven. For example, Bulgaria and Poland are unable to achieve the binding climate and energy targets set by the European Union, and cannot formulate reasonable emission reduction targets. However, some countries can use renewable energy to make detailed emission reduction plans. For example, the Republic of Montenegro has not only set the total 2030 consumption target of renewable energy, but also made corresponding provisions for the energy segmentation field, which shows the determination and ability of the Montenegrin government in energy transformation.

*Table 1. Climate targets in Central and Eastern Europe*

Country	Carbon reduction target	Renewable energy target by 2030
Albania	Reduce unconditional emissions 20.9% by 2030 compared to 1990.	54.4% of energy from renewable sources in gross final consumption of energy
Bosnia and Herzegovina	Reduce conditional greenhouse gas emissions to 36.8% below 1990 levels by 2030.	43.6% of energy from renewable sources in gross final consumption of energy
Bulgaria	Phase out coal in 2038 or 2040.	25% of energy from renewable sources in gross final consumption of energy
Croatia	Reduce 7% of greenhouse gas emissions compared to 2005 by 2030.	36.4% of energy from renewable sources in gross final consumption of energy
Czech Republic	Reduce carbon emissions by 14% relative to 2005 by 2030.	22% energy from renewable sources in gross final consumption of energy
Estonia	70% greenhouse gas emission reduction by 2030 relative to 1990; a climate neutrality goal by 2050.	100% electricity from renewable energy source

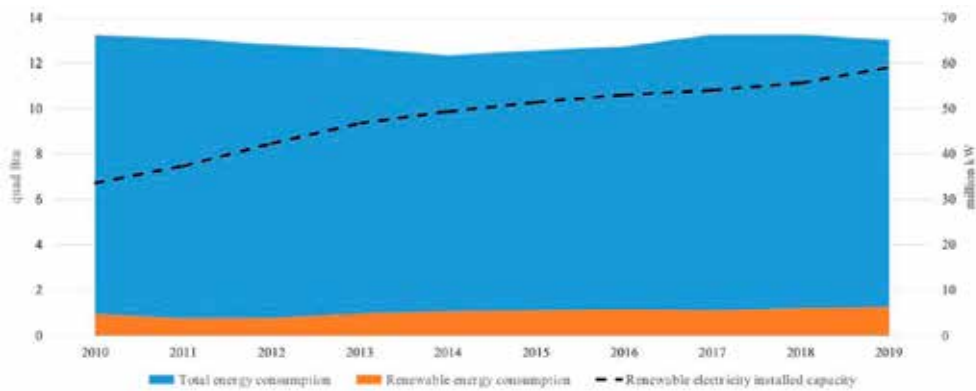
Greece	Reduce greenhouse gas emissions by more than 42% compared to emissions in 1990.	At least 35% in gross final energy consumption
Hungary	Carbon-emissions reductions of at least 40 percent by 2030 compared with 1990 levels; Carbon neutral by 2050.	20% energy from renewable sources in gross final consumption of energy
Latvia	65% reduction in greenhouse gases by 2030 compared to 1990; Climate neutrality by 2050.	50% energy from renewable sources in gross final consumption of energy; 7% of energy used in transport from renewables
Lithuania	Reduce greenhouse gas emissions from all sectors of economy by at least 40% compared to 1990.	45% of renewables in final energy consumption
North Macedonia	Decreases greenhouse gas emissions up to 61.5% in 2040.	38% energy from renewable sources in gross final consumption of energy; 10% RES in final energy consumption in transport; 45% RES share in gross final energy consumption for heating and cooling
Montenegro	Reduce carbon emissions by 35% below 1990 levels by 2030.	Up to 20% replacement of heating coal by solar and biomass; 10% biomass in fuel; 25% hot water from renewables by 2030; 15% space heating from renewables
Poland	Close the last mine in 2049.	Capacity of energy from renewable sources in the national mix will increase from 28GW in 2025 to 50GW
Romania	Exit coal by 2032; Reduce emissions by 2% relative to 2005 by 2030.	30.7% energy from renewable sources in gross final consumption of energy
Serbia	Reduce emissions 13.2% compared to 2010 levels, or 33.3% compared to 1990 levels, by 2030.	41% of gross final energy consumption by 2030
Slovakia	Net zero greenhouse gas emissions by 2050: 60% emissions decline relative to 1990 levels by 2050.	19% renewables in final energy consumption; 27% in the electricity sector

Slovenia	Reduce greenhouse gas emissions arising from energy consumption by at least 40% until 2030 as compared to 1990; Reduce greenhouse gas emissions arising from energy consumption by a minimum of 80% by 2050 as compared to 1990.	At least 27% of total energy usage; 43% of total electricity consumption
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Source: Compiled by the author with reference to government reports of various countries.

On the whole, Central and Eastern European countries have rich potential for clean energy, and wind and solar energy are the dominant energy sources in the region. However, the proportion of renewable energy in energy consumption in Central and Eastern Europe is not high at present. Although the installed capacity of renewable power has almost doubled in the decade from 2010 to 2019, the consumption of renewable energy has not increased significantly (Figure 1).

Figure 1: Renewable energy consumption in Central and Eastern Europe



Source: U.S. Energy Information Administration

## 2. The “Belt and Road” and Central and Eastern Europe Energy Transformation

Since the establishment of the “16+1 cooperation” (Greece joined in April 2019 and upgraded to the “17+1 cooperation”), China’s cooperation with Central and Eastern Europe has become increasingly close, and the field is also

expanding. Central and Eastern Europe also plays an important pivotal role in the construction of the “the Belt and Road”.

The “the Belt and Road” is a new initiative proposed by China to the international community, which has aroused widespread concern. Central and Eastern European countries are located in an important region along the “the Belt and Road”, accounting for a quarter of all 65 countries along the “the Belt and Road”, and playing an important role in the construction of the “Belt and Road”. Central and Eastern Europe is located at the junction of Eurasia, adjacent to developed European economies in the west, Russia and Ukraine in the east, the Baltic Sea in the north, and the Central Europe Land Sea Express in the south via Hungary. It is an important regional fulcrum in the construction of the “the Belt and Road”. Bulgaria and Romania are located between Europe and Asia, adjacent to the Black Sea and the Danube River. After arriving in Central Asia and West Asia via the “Silk Road Economic Belt”, goods can be transferred in the two countries and then transferred to other countries and regions; The Baltic countries have high-quality ports, and the “Five Ports Alliance” cooperation between Croatia, Slovenia and Italy is an important part of the North-South transport network. Through mutually beneficial and win-win cooperation, China and Central and Eastern Europe can jointly establish a more prosperous logistics and trade network along the “the Belt and Road”.

Since the European debt crisis, the EU’s support for Central and Eastern European countries has been weak, while the Central and Eastern European countries have a strong dependence on external markets and international trade. In recent years, international trade protectionism and unilateralism have risen. Central and Eastern European countries are also actively seeking broader new markets and sources of investment. The foundation and core of the construction of the “the Belt and Road” is connectivity, that is, to open up the fault and marginal areas that were originally outside the globalization process and incorporate them into the new integration process (Tang et al., 2021).

The global energy green low-carbon transition and addressing climate change challenges are the background of the green “the Belt and Road” initiative. The three industrial revolutions have created a 250-year history of economic growth for mankind (Zhang, 2018), and also brought increasingly serious environmental problems. The first and second industrial revolutions took coal, oil and natural gas as the main energy, and the pollution of oil and natural gas decreased compared with coal, but with the increase of production scale and consumption level, the pollution was still expanding. Since the 1950s, the world is experiencing the third industrial revolution, namely the green industrial revolution (Li, 2018). How to achieve low-carbon development in the future

has become the key. Most developed countries generally have the phenomenon of “pollution before treatment”. In order to better solve their own environmental pollution problems, developed countries, while vigorously developing and utilizing advanced technologies, also transfer the industrial chain links with low added value, high emissions and high energy consumption to developing countries. Although this approach has improved the national environmental situation, it has not effectively solved the global environmental problems, but only the internal transfer of pollution in the world. The “the Belt and Road” initiative and the idea of building a community with a shared future for mankind have provided Chinese wisdom for global environmental protection and climate change. Accelerating the green transformation cooperation between China and countries along the “the Belt and Road” not only meets the needs of global environmental protection and climate change, but also meets the interests of all countries.

China CEE clean energy under the framework of the “the Belt and Road” is in line with the promotion of complementary advantages and the development needs of both sides. The energy transformation of Central and Eastern European countries is facing financial and technological development challenges (Cooke, 2015). While China has advanced technology and rich experience in clean energy fields such as wind power, hydropower, photovoltaic, nuclear power, etc. It dominates the manufacturing and trade of most clean energy technologies in the world, and is also a net exporter of many of these technologies. It can carry out in-depth cooperation with Central and Eastern European countries in the fields of green energy project development, smart grid, engineering construction and pipe network construction.

### **3. Significance of China-CEEC clean energy cooperation**

China-CEEC clean energy cooperation has become an important part of China-EU economic cooperation. The Central and Eastern Europe region is rich in clean energy resources, but compared with the European Union, there is still a gap in the proportion of renewable energy, and the future development potential is huge. The clean energy cooperation between the two sides has promoted the economic development and regional balance in Central and Eastern Europe, narrowed the gap with Western Europe in clean energy transformation, and helped Central and Eastern European countries improve their status in Europe (Jing,2020).

China-CEEC clean energy cooperation provides important support for regional development and post-epidemic green recovery. In recent years, the

GDP growth rate of Central and Eastern Europe is higher than that of Western Europe, the contradiction between energy supply and demand is constantly emerging, and the external dependence of energy continues to increase. In 2019, energy imports exceeded 40%. At the same time, the proportion of renewable energy consumption in some Central and Eastern European countries is still significantly lower than the EU 2030 target, and the pace of clean energy transformation needs to be further accelerated. Chinese enterprises use their advantages in equipment, construction and operation to continuously increase investment in wind power, photovoltaic and other fields, and explore the possibility of cooperation in nuclear power. At the same time, Chinese enterprises kept their promises, kept their integrity and innovation, and overcame many difficulties to start construction after the epidemic stabilized. In the event that Chinese workers could not arrive in time due to the epidemic, Chinese enterprises represented by Northern International achieved the localization of labor, procurement and consulting services to the maximum extent, ensuring the timely and high-quality completion of the project, and laying the foundation for the rapid recovery and green development after the epidemic in Central and Eastern Europe.

China-CEEC clean energy cooperation has become an important grip in tackling climate change. Both China and Central and Eastern European countries are faced with the dual tasks of developing their economies and tackling climate change. For example, Serbia approved the Climate Change Law in 2021 and plans to build a low-carbon society by 2050. In response to the call of the Chinese government and the needs of the host country, Chinese enterprises have pushed a large number of renewable energy projects into the planning, construction and delivery stages. According to statistics, in February 2021, the first batch of projects of Poland's 51.5MW photovoltaic power station contracted by Chint New Energy will be connected to the grid, reducing carbon dioxide emissions by 50 000 tons per year. In May of the same year, the 100 MW photovoltaic power station project in Koboshburg, Hungary, invested by China Machinery Import and Export Co., Ltd., was officially launched and put into operation recently, reducing carbon dioxide emissions by 120000 tons per year. Especially after China proposed the "double carbon" goal and promised not to build new coal power projects overseas, Chinese enterprises' enthusiasm for investment in the clean energy industry in Central and Eastern Europe was further enhanced. China-CEEC clean energy cooperation will certainly make important contributions to tackling climate change.



#### **4. Policy Suggestions for China-CEEC clean energy cooperation**

Although the 17 Central and Eastern European countries are in the same region, there are more differences behind the regional commonality (Ćetković & Buzogány, 2019). Central and Eastern Europe and South-Eastern Europe, the euro area and non-euro area countries, the EU and non-EU member countries, the potential candidate countries and non-potential candidate countries of the EU and other different titles show the heterogeneity of countries in the region. Central and Eastern European countries have significant differences in language, culture, religion, social customs and traditions, economic scale, self-identity and other aspects. There are also certain differences in the relationship between China and 17 countries in Central and Eastern Europe. China (Serbia) and Poland (Poland) are comprehensive strategic partnerships, while Zojé (Czech Republic) and China (Bulgaria) are strategic partnerships. Considering the individual needs of Central and Eastern European countries, we should avoid “17+1” cooperation in chaos or “model house” cooperation.

##### **(1) Diversified cooperation**

Because there are large political, economic, cultural and social differences between Eastern European countries, China and these countries are easily affected by these differences when conducting cooperation, so we need to build energy cooperation mechanisms with different countries. Under the framework of “17+1”, Chinese enterprises can be led by the Ministry of State to promote the establishment of multi-level, standardized and standardized cooperation mechanism between provinces with large energy demand and Central and Eastern European countries, and finally form the cooperation strategy of “one country, one country, one policy, one province, one country, and one province linkage”, attract more market participants, and promote the formation of a fixed mechanism for China-CEEC energy cooperation. Different cooperation standards should be formed for different energy fields, and standards should be relaxed in energy fields closely related to China, which can be further deepened.

“Diversity” is not only reflected in cooperation subjects and cooperation strategies, but also in the content of cooperation. China and the governments of Central and Eastern European countries should work together to promote more comprehensive cooperation in renewable energy production capacity, not only limited to the construction of power stations, but also expanded to the upstream and downstream industrial chains, power grids and other infrastructure, so as to better play the synergy of renewable energy investment, and provide assis-

tance for promoting economic development, energy transformation and social well-being in Central and Eastern Europe.

## **(2) Third-party cooperation**

Since the launch of China-CEEC cooperation, Europe has been worried that “cooperation will divide Europe”. President Xi pointed out that China-CEEC cooperation is an important part of China-EU relations, and the development of China-EU relations has brought new opportunities for China-CEEC cooperation. The cooperation between China and Central and Eastern European countries does not exclude the participation of the EU. Instead, the EU is invited to participate constructively in the cooperation as an observer, so that it can see the cooperation from a more impartial and objective perspective. Third party cooperation with China in Central and Eastern Europe can be carried out by the two sides, which can perfectly combine capital, technology and experience, and expand the scope of win-win cooperation. Third-party cooperation increases the trust of people in Central and Eastern Europe in China, and at the same time, it can reasonably share the project risks to ensure the smooth completion of the project.

## **(3) Progressive development**

After determining the areas of national energy cooperation, countries can strengthen cooperation to jointly research and develop energy, first of all, strengthen the construction of infrastructure, such as wind turbines, solar panels and optical cables. Secondly, actively play the role of the energy science and technology cooperation center between China and Poland and Eastern European countries, build a higher level and wider range of energy science and technology cooperation platform, and further strengthen the market promotion and application of science and technology. Then, in order to expand energy investment and explore new models, it is necessary to develop new industries. For example, the desert areas in Central and Eastern Europe can learn from the new model of China's photovoltaic desertification control, and carry out the practice of coordinated development of renewable energy and ecological environmental protection. Promote new business forms such as agricultural and optical complementation, fishing and light complementation, and grazing and light complementation, accelerate the deep integration of renewable energy and traditional industries such as construction, transportation, and industry, and finally realize the coordinated development of China and Central and Eastern

European countries. Do not rush for quick success or instant benefit, otherwise it will affect the progress of national cooperation.

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