Shanxi pushes energy revolution full steam ahead

Province in North China working toward using more sustainable sources

By YUAN SHENGGAO

A low-carbon energy development forum opening on Friday in Shanxi's capital city of Taiyuan will become a showcase of Shanxi's latest efforts and achievements in sustainable growth, the event's organizers said.

According to Wang Ligang, deputy secretary-general of the two-day forum's organizing committee, the event, which is also known as Taiyuan Forum among industry insiders, is being held both offline and online.

Wang said it is the first high-profile forum in China's energy industry since Chinese authorities proposed the country's goal for carbon peaking in 2030 and carbon neutrality in 2060.

With a theme centering on energy, climate and the environment, the forum will discuss topics including energy revolution; carbon peaking and neutrality; and ecological civilization. Participants include government officials, industry experts and business representatives from home and abroad.

Wang said the event displays the Chinese authorities' determination to promote low-carbon development and their willingness to enhance international cooperation in this field.

Shanxi's achievements in the energy revolution are a highlight of the event, according to Wang.

As Shanxi used to be a leading coal producer in China, its reliance on coal and related heavy industries had caused a number of challenges to its social and economic development, including low growth rates and pollution.

To address the challenges, Shanxi began to implement a transformation plan to reduce its reliance on coal, upgrade traditional industries and foster high-tech and emerging sectors as new growth drivers.

The energy revolution, which involves promoting the development of clean energy resources and upgrading coal-related industries toward the direction of more efficient and cleaner production, is a major part of Shanxi's economic transformation plan, according to Wang.

The official said the latest achievements in energy revolution and low-carbon development made by various cities in Shanxi are also a highlight of the event.

Clockwise from top left: Workers assemble cars at Geely's new energy vehicle plant in Jinzhong. LI ZHAOMIN / FOR CHINA DAILY Workers assemble clean power generation machinery at a manufacturing plant in Zhangzi county. LIU FENG / FOR CHINA DAILY Mining equipment is installed in Qinshui county for extracting coalbed gas. KONG LEI / FOR CHINA DAILY Zhuangshang in Ruicheng county is a "zero-carbon" village recognized by the United Nations Development Programme because of its use of clean energy. XIAO YONGJIE / FOR CHINA DAILY

Changzhi

The city of Changzhi in the southeast of Shanxi is among the pioneers of the province proposing an implementation plan for energy revolution.

The plan, including 44 measures for 10 industrial fields such as smart mining, clean coal production and solar power development, has clarified the city's direction and path toward carbon peaking and neutrality with clear timetables, road maps and well-defined responsibilities of government institutions and businesses.

According to the scheme, a total of 61 new energy projects have been planned for Changzhi's energy revolution, including facilities for the production of coal-based new materials; resource recycling; power generation near coal mines and power generation using clean energy resources; as well as smart power transmission grids and energy storage.

There are also projects in the research and development for energy revolution, in cooperation with the nation's renowned universities like Tsinghua and research institutions including the Chinese Academy of Sciences.

Of these, 58 projects with a combined investment of 74.61 billion yuan ($11.49 billion), including a smart coal mine funded by Lu'an Group and a photovoltaic component plant invested in by Rishengda Corp, were listed as the province's key projects.

Datong

The efforts of Datong in northern Shanxi in energy revolution highlight the balance between developing new, clean energy resources and upgrading the coal mining industry toward the direction of clean and efficient production.

On the barren hills in the village of Shiren in the city's Yunzhou district, a huge solar farm is what local residents are pinning their hopes on for increasing family incomes and reducing poverty.

"More than 1,000 low-income families like mine are closely linked to this solar farm, as it is designed for poverty alleviation," said Zeng Shiguo, a local resident. "It brings in about 3,000 yuan to every household involved on an annual basis."

The solar farm is funded by Longji Green Energy Technology.

Longji Green Energy Technology is among the first companies in Datong to be engaged in new energy development. It has invested in four large-scale solar power stations and three production plants for producing photovoltaic components and power-storage facilities in Datong.

The city of Datong has also made efforts to upgrade its coal mining industry by phasing out outdated capacities and promoting clean production. It fulfilled its goal in the industrial upgrading program in 2019, with more than 60 percent of its coal production capacity reaching advanced levels featuring automation, modern operations, efficient production and lower emissions, according to local officials.

Supporting Datong's energy revolution are a number of high-tech zones in the city, focusing on R&D in new energy resources and smart production. The zones are home to 10 research institutions funded by the CAS and led by 28 top scientists.

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> **Zeng Shiguo,** a resident in Shiren village in Yunzhou district, Datong

Jincheng

The city of Jincheng in the southeast of Shanxi has focused its efforts on upgrading the coal mining industry for an energy revolution.

Its latest five-year plan for the coal industry required the phaseout of all the coal mines with a capacity of less than 600,000 metric tons a year and the goal was achieved at the end of 2020.

In addition, there are 27 medium and large-sized coal mines which have shifted their operations from coal mining to the production of lower-emission resources like coal bed gas and coal-based chemicals.

Upon the completion of the phaseout and transformation programs, the city's industrial regulators recently proposed an action plan to promote the smart operations of coal mines.

Jincheng has established a city-wide database to guide the intelligent production of coal mines. Changping and Sihe No 2 are the two pilot coal mines that have completed automatic and intelligent mining operations. Projects to promote smart mining are now underway in another 151 mining shafts, which are expected to be completed in the following several years, according to local officials.

Lyuliang

Lyuliang city in western Shanxi is one of the pioneers in the province using 5G communications technology to equip its coal mines for smart and safe production.

Xinyan Coal Mine operated by Dongyi Group, for instance, was among the first companies in Shanxi to digitalize its coal mining with 5G in 2020.

"With a 5G network reaching every shaft, all the production processes, including mining, conveying, drainage and safety monitoring, can be controlled at our smart operational center," said Mei Jun, chief engineer of Xinyan Coal Mine.

Mei said the intelligent operation has led to a saving in labor cost of about 30 million yuan a year. In addition, the improved efficiency can also help to slash the operational cost by 15 yuan per ton of coal produced.

The city's industrial officials said the digitalization of another two coal mines is underway, which include 128 mining shafts.

The city has also seen steady growth in the production of cleaner energy resources. Its output of coalbed gas reached 1.27 billion cubic meters in the first seven months of this year, growing 131 percent year-on-year. Construction of a 100,000-megawatt wind power station is underway, which is expected to begin operation at the end of the year.

Linfen

In the city of Linfen, local authorities' and businesses' efforts to help with the carbon peaking and neutrality goals are not limited to the coal-mining industry. High-energy-consuming industries like steelmaking are the targets of local low-carbon development plan.

Jinnan Steel and Iron based in Linfen's Quwo county, for instance, has used such technologies as 5G, big data and the industrial internet to help improve the efficiency of its production.

Executives at this privately run company said the digitalized production has significantly reduced the consumption of coke in steelmaking and the emissions of carbon dioxide and other polluting gas.

Through improving the efficiency of coke-consuming manufacturers, the city's coke output was reduced by 10.9 million tons in 2019 and 2020, accounting for 27 percent of the total reduced capacities in Shanxi.

Carbon reduction is also a highlight of the city's public service sector. All the buses for public transport have been electrified and cleaner energy like natural gas and solar energy is used for centralized heating, according to local officials.

Jinzhong

One of the proponents of the energy revolution in the city of Jinzhong in central Shanxi is hydrogen, a fuel with zero emissions.

A recent development is the construction of a hydrogen fuel cell production plant in the Jinzhong development area of the Shanxi Transformation and Comprehensive Reform Demonstration Zone. The plant is funded by Meijin New Energy.

"With an investment of 550 million yuan, the project has seen a majority of its structures completed," said Chen Zhizheng, a Meijin executive in charge of the new project. "The general assembly plant (for hydrogen-fuel-cell systems) began operating recently."

The Meijin plant mainly produces hydrogen-fuel-cell drivetrains and components for vehicles. Upon completion, it is expected to become the largest hydrogen fuel cell production base in China. It also has plans to develop and produce hydrogen-fueled commercial vehicles.

Jinzhong plans to develop itself into a new energy vehicle production hub in Shanxi by fostering an industrial cluster with an annual output value of more than 100 billion yuan. To date, more than 13 manufacturers and component producers, including Geely and SND New Energy Special Vehicle, have settled in the city.

Xinzhou

The city of Xinzhou is transforming its energy industry by increasing the proportion of new energy resources, such as wind power, for electricity generation.

According to the local government, Xinzhou's new-energy power generation capacity reached 8.44 million kilowatts by the end of 2020, accounting for 56.59 percent of its total power generation capacity. The ratio ranked it first in Shanxi.

Xinzhou is one of the key coal production bases in Shanxi. But the city began to reduce its reliance on coal in recent years by shutting down coal mines with outdated production facilities. As a result, its total number of coal mines has been reduced from 81 to 67 at present, with 81.8 percent of the total capacity being advanced and more efficient facilities.

The city is promoting intelligent coal mining, with 27 mining shafts planned to be digitalized.

Xinzhou is using cleaner energy, including natural gas and solar energy, to take the place of coal for heating in both urban and rural areas.

Shuozhou

The city of Shuozhou now eyes the energy storage industry as a new breakthrough point for its energy revolution.

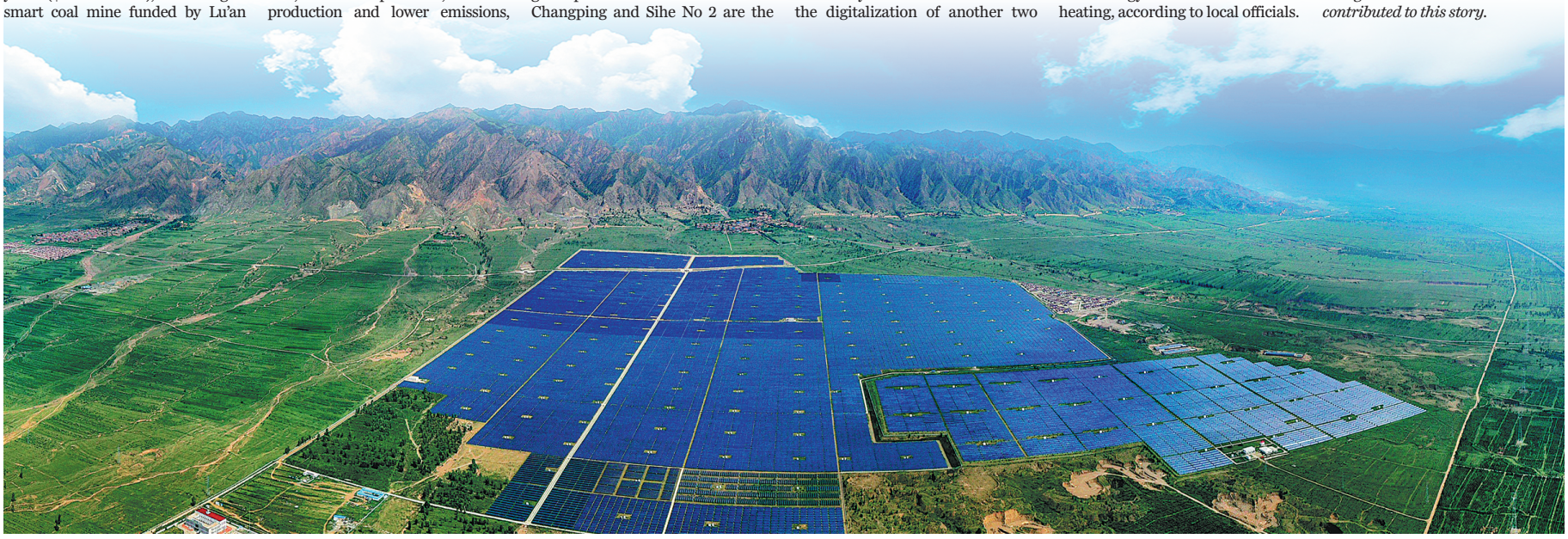
Local industry insiders said the energy storage industry is crucial for the efficient operations of solar and wind power stations and the electric vehicle industry.

Energy storage facilities can help with stable power supply to grids.

A recent development is the construction of a 300-megawatt-hour power storage station funded by the local company of Jinfeng and the 400-800-mWh power storage stations built by Huashuo New Energy.

For power storage used for electric vehicles, Shuozhou's electricity companies are building a citywide network for charging and battery swapping. The network is connected to the internet, allowing users to access services easily, according to the city's officials.

Wang Pei and Li Shu contributed to this story.



The county of Tianzhen in Datong is known for its booming solar power industry. TIAN ZHONG / FOR CHINA DAILY