

# Lyuliang leads charge in forging a cluster for the hydrogen industry

Shanxi currently boasts six filling stations and two logistic bases for the storage and transportation of the clean fuel in a number of cities



By YUAN SHENGGAO

Pengfei Group, a company based in the city of Lyuliang, delivered the first batch of 100 hydrogen-fueled heavy-duty vehicles on Nov 22, marking a new milestone in the development of a hydrogen industrial chain ranging from gas production, storage and transportation to hydrogen vehicle manufacturing in the North China province of Shanxi.

Executives of Pengfei said the powertrain system and core components of the vehicles were developed by Pengfei Group and its partners nationwide.

They said one such vehicle can reduce up to 12 metric tons of carbon dioxide emissions in a journey of 10,000 kilometers, so it is expected to play a major role in China's carbon peaking and carbon neutrality initiative before 2030 and 2060 respectively.

Lyuliang city is one of the pioneers in China in the development of hydrogen as a new source of energy.

During this year's United Nations climate change conference, known as COP27, held in Sharm el-Sheikh, Egypt, on Nov 14, the practices by Lyuliang in hydrogen energy development were shared as a successful case of study among the event participants.

Lyuliang's unique development in this sector includes manufacturing hydrogen from coking gas, nurturing the hydrogen-powered automobile industry and developing hydrogen-filling facilities.

In addition to the booming development of the hydrogen industrial chain, Lyuliang has also made remarkable achievements in all fronts of sustainable growth.

With an average annual increase of 1 percent in forest coverage in recent years and constant efforts in emission and pollution control, the city now ranks among the nation's top 20 cities in terms of air quality improvement.

Its GDP has grown at an average annual rate of 5.8 percent, while the ratio of energy use to GDP fell 3.6 percent annually.

The development of hydrogen is also an important part of Shanxi's energy revolution campaign, which involves developing clean energy resources and upgrading the traditional coal-mining industry toward the directions of high

efficiency and clean production.

In addition to Lyuliang, hydrogen production and other related industries have been developed in cities such as Datong, Taiyuan and Changzhi.

Local officials and industry insiders said Shanxi has unique advantages in developing the hydrogen industry.

"Hydrogen can be made through water electrolysis and extracted from coal-bed methane," said an official of the Shanxi Department of Industry and Information Technology. "But conversion from coking gas is among the most economical ways."

The official said Shanxi is now the largest coke producer in China and in the world.

"In Shanxi, coking gas, a side product of coke making with a hydrogen content of up to 60 percent, can be used to develop the largest hydrogen production industry in the world."

He estimated that Shanxi's coking plants can produce 14 billion cubic meters of hydrogen a year. The output, plus the lower cost of production in contrast with other hydrogen-producing techniques, means Shanxi's hydrogen industry, will have promising market prospects.

Zheng Peng, chairman and presi-



Pengfei Group launches operation of a hydrogen-producing facility on July 6 in the Pengwan Hydrogen Port, an industrial park in Lyuliang city. WU LIUHONG / FOR CHINA DAILY

dent of Pengfei Group, said the company is one of the pioneers in the province and even in the country in producing hydrogen from coking gas.

"Pengfei has been a comprehensive player in the coal industrial chain, from mining and coking to coal-based chemicals," Zheng said. "It was because of the cooperation with renowned Chinese scientists in the hydrogen industry that we tapped into the potential of coking gas-hydrogen conversion in recent years."

A team of experts headed by Jin Zhixin, an academician of the Chinese Academy of Engineering, is now stationed in Xiaoyi, a city under the jurisdiction of Lyuliang. It is offering tailored technological solutions for hydrogen production to local enterprises that included Pengfei.

With the help of the experts,

Pengfei's hydrogen plant with an annual capacity of 20,000 tons was put into operation on July 6. It announced the completion of hydrogen-filling stations on July 21.

The total hydrogen-producing capacity of local enterprises in Shanxi has reached 40,000 tons to date. The province now has six hydrogen-filling stations and two logistic bases for the storage and transportation of the gas.

Lin Zhongqin, president of Shanghai Jiao Tong University and an academician of the Chinese Academy of Engineering, predicted the demand for hydrogen in China will reach 37 million tons in 2030, accounting for 5 percent of the country's total energy consumption.

He estimated that the demand will reach 130 million tons in 2060, accounting for 20 percent of Chi-

na's total energy consumption.

Lin suggested Shanxi develop itself into a pacesetter in the industry by constructing the technological and industrial chains with the highest such level in the country.

This year, Shanxi saw the groundbreaking of nine large-scale projects in the hydrogen industrial chain, with investments totaling 13.56 billion yuan (\$1.94 billion). Zhang Guangyong, mayor of Lyuliang, said the city is expecting to develop the hydrogen industry into a pillar sector with annual output of more than 100 billion yuan.

To realize this ambition, Lyuliang is closely cooperating with 42 renowned universities and research institutions in the country to launch 90 research and development facilities in the city.

Yan Zhongxing contributed to this story.

## Yongji a center for arts along the Yellow River

By YUAN SHENGGAO

When people talk about the city of Yongji in Shanxi province, they usually associate it with a household poem and a famous ancient play.

The city lies to the east of the Yellow River, just when it is about to bend its north-to-south course to go all the way east to the sea.

Near the river stands the centuries-old Guanque Lou, or Stork Tower. It was the site that inspired Wang Zhihuan during the Tang Dynasty (618-907) to create the poem of the *Ascending Stork Tower*:

"The setting sun beyond the mountains glows,

The Yellow River seaward flows.

One can enjoy a grander sight,

By climbing onto a greater height."

The poem is so popular that almost every schoolchild in China can recite it. The tower has since become the pride of people in the area and a draw for tourists.

Like Stork Tower, another attraction that has also shaped the lifestyle of people is the Pujiu Buddhist Temple, the setting of *Romance of*

*Western Chamber*, one of the four greatest ancient plays in China.

Bathed in the atmosphere of poetry and literature, today's residents in Yongji still live under a lifestyle of good taste, composure and leisure.

The local government's dedication to realizing high-quality development, which includes efforts to create a good living environment and cultivate a resilient economy to help people grow their income, is one of the important reasons to ensure a decent life for its residents.

The government's recent moves to optimize the environment include improving the local rivers and lakes, restoring the ecological system and developing leisure facilities.

With efforts to increase vegetation coverage, the small city now has a total green area of 10 square kilometers, with a per capita green area reaching 14.6 square meters.

Apart from the renowned Stork Tower and Pujiu Temple, there are a great number of venues for people to relax, including the wetlands along the Yellow River and the Wuxing Lake, as well as an 11-km green path, so people can cycle, walk or jog.



The city of Yongji has a per capita green area of 14.6 square meters. ZHANG HAIYING / FOR CHINA DAILY

The city has seen a rising number of cultural facilities to help people stay in constant touch with the brilliant cultures that have nurtured their spiritual well-being for hundreds of years.

They can visit the museums to learn about its history, read in the libraries to keep literature in their minds and sit in theaters to watch operas related to the *Romance of Western Chamber* and others.

To help residents increase their revenue, the city has developed a competitive economy.

Traditionally, it is a famous tourist destination in Shanxi, a major grain producer in China and one of the country's hubs for the food industry.

Today, five emerging industries of

electrical capacitors, new-energy batteries, photoelectronics, automotive components and new materials have developed into new economic pillars for the city.

The city is also growing into an attractive destination for investors from home and abroad.

The Yongji Economic and Technological Development Zone, for instance, has attracted 17 large investment projects with funding totaling 14.12 billion yuan (\$2.02 billion) yuan since April, said Yun Chenxing, chief of the zone's administration committee.

Zhang Haiying contributed to this story.

## Province moves to control soil erosion

By YUAN SHENGGAO

Shanxi province, which used to suffer from severe soil erosion, has seen steady improvements after decades of efforts.

Shanxi is located in the middle reaches of the Yellow River and in the eastern part of the Loess Plateau. The region had been a victim of soil erosion for many centuries because of its terrain being dominated by mountains and hills with less vegetation coverage and loose soil.

In the early 1950s, the area of soil erosion in Shanxi was 108,000 square kilometers, of which 67,600 sq km was in the Yellow River drainage basin. The soil erosion-induced annual sediment in the Yellow River was 366 million metric tons during that period.

Shanxi began its initiative in curbing soil erosion in that period and the pace has been accelerated since 2012.

After years of continuous treatment, the area of soil erosion in the province has been reduced to 58,000 sq km at the end of 2021, a decrease of 12,300 sq km, or 17.5 percent, from the figure of 70,300 sq km in 2011. This also means that 63 percent of Shanxi's territory has been freed from soil erosion.

In Shanxi, the efforts in soil erosion are a combination of greening and engineering measures.

With regard to greening, Shanxi has seen an annual addition of nearly 270,000 hectares of forest in recent years on average. The lat-

est survey by the Shanxi Forestry and Grassland Administration shows that the province's forest coverage surpassed 25 percent at the end of 2020.

Engineering measures, such as building level terraces and works for gully head protection, also proved to be successful in erosion control. This is especially true in the areas of the Lyuliang and Taihang mountains, which feature steeper slopes.

The province has enhanced legislative efforts for curbing soil erosion, especially that caused by human activities.

Over the past few decades, Shanxi has released a number of regulations and laws for soil erosion control and has deployed special task forces for law enforcement.

During 2020-21, for instance, the province implemented a special law enforcement campaign to curb activities that could lead to soil erosion.

Thanks to the use of the latest technologies like remote sensing, provincial law enforcement identified 1,155 projects with potential risks of soil erosion and ordered the related businesses to act.

The province will continue its efforts to curb soil erosion in the years to come. According to Shanxi's 14th Five-Year Plan (2021-25) for Soil Erosion Control, it plans to bring nearly 370 sq km of eroded land under control every year over the next three years.

Li Shu contributed to this story.



Level terraces have been developed on the hills in the county of Yanggao to curb soil erosion. WU LIUHONG / FOR CHINA DAILY

## Foreign trade businesses reap rewards of RCEP

By YUAN SHENGGAO

In less than a year since the Regional Comprehensive Economic Partnership took effect, foreign trade businesses in Shanxi have reaped the benefits from this regional trade assistance program for Southeast Asia, East Asia and Oceania.

The RCEP came into effect on Jan 1 after agreements were achieved among six Association of Southeast Asian Nations members — Brunei, Cambodia, Laos, Singapore, Thailand and Vietnam — as well as four non-ASEAN signatory states: China, Japan, Australia and New Zealand.

For Yongdong Chemicals, an exporter of carbon black, based in the city of Yuncheng, its direct gain from the initiative is the reduced tariff resulting from the RCEP certificate of origin. Carbon black is a material produced by the incomplete combustion of coal and coal tar, vegetable matter, or petroleum products.

"With this certificate issued by Yuncheng Customs, the tariff imposed on our exports to Japan has been reduced from 3.9 percent to 3.5 percent," said Chen Qian, an



A customs officer in Yuncheng grants an RCEP certificate of origin to a representative of a local company. MENG TING / FOR CHINA DAILY

executive of Yongdong Chemicals. "The decreased tariff will surely lead to increasing competitiveness of our products in Japan."

She added that there will be a steady decrease in the rate in the years to come until the tariff reaches zero in the 11th year.

The executive said her company has been granted a total 83 such certificates since January for goods with value totaling \$19.12 million.

"Boosted by this new practice, we

saw our export prices rise about 10 percent from 2021," Chen said.

Yu Wenfang, an official at Taiyuan Customs, said that she noticed the RCEP certificate of origin is favored in the Japanese market.

"Japan is the largest destination market for exports with an RCEP certificate of origin," Yu said. "We granted 997 such certificates for products exported to the Japanese market during the first three quarters, with a total value of \$67.31 million."

During the first 10 months of this year, Taiyuan Customs issued 1,214 RCEP certificates of origin for exports totaling \$76.3 million. It also handled 128 million yuan (\$18.44 million) worth of imported goods with such certificates from overseas.

Some industry-leading companies in Shanxi have the autonomy to produce certificates of origin themselves.

Huaxiang Group, a household appliance manufacturer and exporter based in the city of Linfen, was the first company in Shanxi authorized to issue such certificates.

"Since the beginning of this year, our company has issued 37 certificates for goods amounting to 6.73 million yuan," said Wang Zhifang, general manager of Huaxiang Group.

According to Yu of Taiyuan Customs, the autonomy of issuance is usually granted to enterprises with long-term experience in international trade and their own strict quality control system.

Meng Ting contributed to this story.