

Shanxi rings in changes across industrial hubs



Provincial people's congress sets forth plan to promote unique expertise of manufacturing areas

By YUAN SHENGGAO

The Shanxi county of Dingxiang, a flange production base with a nationwide reputation, is expected to enjoy greater industry growth, thanks to the province's recent strategy to develop characteristic towns.

Dingxiang is now home to nearly 200 flange manufacturers of flanges — ribs rims for strength, for guiding, or for attachment to another object. The companies are capable of producing more than 2,000 varieties of flanges used in a range of fields like petrochemicals, power generation, aerospace and astronautics.

The county's output of flange products now accounts for about 30 percent of the national total. It currently supplies 60 percent of wind power generator flanges in the country. Its export of cast-iron flanges takes up about 70 percent of such exports nationwide.

In September 2022, the provincial government announced its first batch of 10 provincial-level characteristic towns and Dingxiang was on the list.

Building towns with characteristic industries is a new strategy in Shanxi,



From left: A digitally controlled rolling machine is used to produce large-sized flanges at a plant in Dingxiang. ZHANG JINLAN / FOR CHINA DAILY. Dingxiang county is a flange production base with a reputation that stretches nationwide. PROVIDED TO CHINA DAILY.

which aims to create new economic engines that accelerate high-quality industrial growth.

During the annual session of the Shanxi Provincial People's Congress, held from Jan 12 to 16, provincial authorities reiterated the importance of growing characteristic towns and showed their support, according to Zhao Yajing, Party secretary of Dingxiang and also a delegate to the congress.

Zhao said that the government work report, which was delivered by newly elected Shanxi Governor Jin Xiangjun at the congress, proposed developing characteristic towns and cities that specialize in famed products, noting that it "should be an opportunity for local enterprises to grow".

The official said Shanxi's plan to foster characteristic industrial towns will help to increase the influence of Dingxiang's flanges in both domestic and international markets.

Shortly after Dingxiang made the

list, the county government announced an action plan for the flange industry's growth and released implementation measures.

The plan said Dingxiang is expected to grow an industrial cluster of flange production and related advanced manufacturing with an annual output worth more than 100 billion yuan (\$14.46 billion) in the future.

Local statistics show that the output value of Dingxiang's flange industry was 14.2 billion yuan in 2022, and the combined sales revenue of local manufacturers stood at 13.9 billion yuan.

To realize this ambitious plan, Zhao and other county officials said that industrial upgrades driven by innovation and expansion by developing an extended industrial chain are crucial.

Dingxiang has now taken the national lead in terms of the number of advanced manufacturing equipment. Its local manufacturers now



boast 754 large casting machines, 7,308 modern machining tools and 5,762 sets of advanced manufacture-aiding equipment that include robots, testing devices and intelligent image identifying systems.

But local entrepreneurs are expecting more to come in their equipment and technology upgrades, especially with the use of digitalized, network-connected, intelligent and automated operations.

Local flange manufacturer Tianbao Group, for instance, is promoting a full-scenario application of digital technologies.

"Digital technologies are now used in almost all operational links including research and development, production, logistics and financial management," said Liu Xiaotao, an executive of the company. "Digitalization has ensured greater efficiency and precision and promoted our core competence."

He cited the company's newly installed digitally controlled rolling

machine for making large flange rings.

"With this new machine, plus a 10,000-metric-ton hydraulic press, we are now capable of making super-large flange rings for wind power generators, with a diameter of 10 meters," Liu said. "This is a sharp contrast with our previous variety of 5 meters."

Dingxiang is also forging a complete industrial chain, which includes upstream steelmaking and casting and the downstream new energy sector, to enhance the flange manufacturing industry.

Casting products manufacturer Baolong Technology, for instance, is an upstream supplier for the flange industry.

"Casting enterprises are a crucial link in the entire industrial chain," said Yang Song, a senior executive of Baolong. "We are playing a part to further extend the chain by cooperating with upper-stream entities like steelmakers and research institutions, aiming to supply high-quality casting

components to flange manufacturers."

A range of projects in the industrial chain have been launched or are under construction in Dingxiang.

In 2022, the Dingxiang Development Zone, a major site for the flange industry, secured seven large projects, with a combined investment totaling 2.77 billion yuan. Also, there are another 20 projects under construction with investment totaling 6.23 billion yuan.

A special steel products manufacturing facility funded by local Qingrui New Material Technology is among the projects.

"It took us less than half a year to finish the procedures of identifying the investment location, negotiation, agreement signing, business registration, land acquisition and commencement of construction," said Wang Jun, a senior executive of Qingrui. "This is because of the highly efficient services provided by the local officials."

Construction for the first phase of the project has been completed and workers of the company are now busy installing and testing equipment for production.

The first phase includes two production lines for special steel products tailored for local flange manufacturers.

"The two lines are capable of producing 180,000 tons products, worth 2 billion yuan, a year," Wang said.

To boost the core competence of the flange industry, Dingxiang's authorities are seeking collaborations with 20-plus research institutions and industrial associations, according to county officials.

Zheng Na contributed to this story.

Machine company boosts efficiency and growth

By YUAN SHENGGAO

Shanxi province is pushing forward an economic transformation move to upgrade its traditional industries and foster emerging industrials as new engines for growth.

Taiyuan Heavy Machinery Group, a traditional manufacturer of mining and metallurgical machines based in the Shanxi provincial capital of Taiyuan, has proven the two missions of transformation can be fulfilled by a single company.

"While using the latest technologies to upgrade our conventional industries for mining and metallurgical equipment building, we are also developing new equipment for rail transit, wind power generation and marine exploration, as well as hydraulic machines," an executive of the company said. "We have seen growing strength in both traditional and emerging sectors."

Yue Haifeng, head of a THMG research institute for mining equipment, said he is proud that the extensive use of digital technologies has brought the group into the ranks of advanced domestic manufacturers for mining and coking equipment.

He said one of the cutting-edge products that the THMG presented to clients is the WK12C intelligent mining excavator.

The machines, now in use at an



Robotic arms transport components at a plant of Taiyuan Heavy Machinery Group. DU JUAN / FOR CHINA DAILY

open-pit coal mine in Huiliin Gol city in the Inner Mongolia autonomous region, have pleasantly surprised the mining workers.

"It revolutionized the concept of excavator operation," said Wang Yongsheng, an excavator operator at the mine. "A driver is no longer needed on the excavator. We operate the machine at the control center some seven kilometers away."

He added that driverless excavator operation can greatly improve both safety and efficiency.

Yue said the secret behind the smart operation is the use of 5G technologies, which make coal cutting possible from a long distance.

In addition to smart coal mining, the THMG smart solutions also include automation for metal smelting, and the "push-button" coking, which realizes the whole-process of coking through a remote control at an operational center.

While upgrading its traditional industries, THMG is also diversifying its operations to the areas of rail transit equipment manufacturing and the production of wind power generation equipment.

THMG Rail Transit Equipment, for instance, is a unit dedicated to the production of train wheels.

Han Yuming, an executive at the unit, said his team has used one of the

world's most advanced production lines at its production plant, which is capable of making a train wheel in less than a minute.

"We realized an output value of 200 million yuan (\$28.98 million) in the first month of this year, growing 34.6 percent year-on-year," Han said.

Zhang Lei, another executive at the unit, said the rail transit equipment company has prioritized innovation since the very beginning of its establishment, thus pushing it to the forefront of the industry.

In June 2022, the world's largest cross-wedge rolling machine was launched in the company. It was jointly developed by THMG Rail Transit Equipment and several renowned research institutions in China.

The company's executives said the machine can help to improve efficiency by 100 percent and reduce costs by nearly 10 percent, compared with its previous versions.

Boasting a provincial-level corporate technology center, a provincial-level key laboratory and several other research and development facilities, THMG is now one of just a few companies in the world that can produce a full portfolio of train wheels, axles and other components.

Du Juan contributed to this story.

Craftsman carves out new life of local legends

By YUAN SHENGGAO

A piece of wood can tell the stories of Shanxi — its history, culture, landscapes and local life, Ye Yaoliang, a famed woodcarving artist said at a recent exhibition in the provincial capital of Taiyuan.

The exhibition opened on Feb 23 at the Taiyuan Cultural Center and has gathered more than 100 woodcarving works from various artists.

According to Ye, Shanxi's woodcarving has a history of nearly 2,000 years. Over millennia, the art has been a vehicle of local culture, with its themes covering historical legends and landscapes. Human figures, mountains, water-scapes, flowers, birds and animals are commonly seen in the art-works.

"We are seeing landmark attractions in Shanxi on the wood carvings displayed here, like the Yellow River, the Great Wall and the Taihang Mountains, as well as the stories and lives relating to these places," Ye said. "The land and people here are the inexhaustible sources of inspiration for woodcarving artists."

Ye said the art in Shanxi reached its peak during the Ming (1368-1644) and Qing (1644-1911) dynasties. The Shanxi merchants, who are said to have dominated commerce in North China during those periods, extensively used woodcarvings to decorate their residences, boosting the popularity and prosperity of the art.

Ye said he once saw a huge carved-frame mirror in the Grand Courtyard of the Qiao Family — a signature residence of the Shanxi merchants — in Qixian county. Featuring the patterns of a moon and a rhinoceros, Ye said this should be considered among the

rarest woodcarving works in the world.

"But nowadays, the art has gradually faded out of local life and is on the verge of extinction," the artist said. "We deem it necessary to preserve the art and pass it down to future generations."

Ye said there are varied styles and characteristics of woodcarving arts across different regions of China. Drawing inspiration from other regions is key to reviving the art in Shanxi, he added.

Ye, now 46, started to learn the art from a master in Zhejiang province when he was 16.

After finishing his three-year apprenticeship, he returned to Shanxi, continued to learn from local artists and began to practice in this trade.

"My apprenticeship in Zhejiang rendered me a new point of view to understand the local art," Ye said. "Then I discovered there is always an air of grandeur in Shanxi's woodcarving artworks, which has been made possible by employing the perspective relation of traditional Chinese painting and portraying landscapes with a sense of depth."

Based on his understanding of the art, Ye has created many masterpieces over the past two decades. His works have been held by a number of private collectors, museums and art galleries.

He said what makes him proud is that some of his works are now displayed at the Shanxi Hall of the Great Hall of the People in Beijing.

Ye is the co-founder and vice-chairman of the Shanxi Association of Woodcarving Artists, which was established in July 2021.

Wu Jia contributed to this story.

Scientist helps China make global gains in high tech

By YUAN SHENGGAO

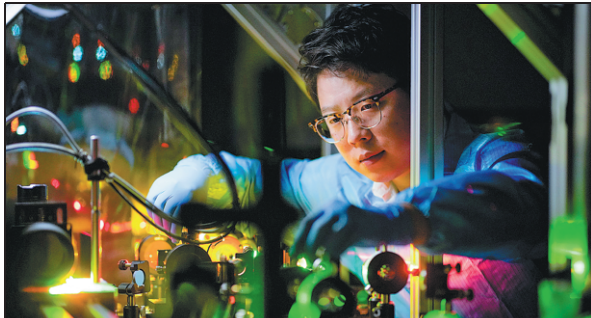
Fin field-effect transistor, or FinFET, is a basic element for nanoelectronic device fabrication. With a history of about two decades in research and one decade in commercialization, the technology is now standing at the forefront of the semiconductor industry.

While developed countries like the United States have led the industry in past decades, China is now at the forefront in at least in one area thanks to the 0.6-nanometer-thin FinFET developed by a scientist in Shanxi.

Han Zheng, a professor at Shanxi University's Institute of Optoelectronics, presented the transistor at the end of 2020. This is by far the thinnest FinFET in the world.

When talking about his course of research in this specialized field, Han said making novel discoveries — new materials with sizes beyond imagination and new structures that do not exist in nature, for instance — can motivate a scientist, especially in the field of physics, to go far.

Han is a native of Jiangsu province.



Professor Han Zheng conducts an experiment at a lab in Shanxi University. LI LIAN / FOR CHINA DAILY

After earning his bachelor's and master's degrees in domestic higher-learning institutions, he secured his PhD degree at Neel Institute in France in 2013 and finished his post-doctorate studies at Columbia University in the US in 2015.

Back in China, he focused his studies on nano science. He joined IOE of Shanxi University in 2020.

"IOE is a great platform for nano

science research where you can work with top Chinese scholars in the field, like Professor Peng Kunchi, an academician of the Chinese Academy of Sciences, as well as sharing your knowledge with young scientists with a keen interest in the field," Han said.

Though a groundbreaking discovery is one of scientists' principal delights, Han said the promising market application of the technology has

been an additional bonus.

He said FinFET can be used in a variety of fields including microelectronics, environmental protection, defense, biology and the energy industry.

"Shanxi province, with one of the most developed energy industries in China, has a rich scenario of application," Han said. "In the energy industry, FinFET can be used for making super-capacitors because of its smaller mass and larger area."

Han also praised the fast-growing technology market in Shanxi.

"We have seen high-quality technologies offer stronger support to Shanxi's economy," he said. "The semiconductor industry, which incorporates a great number of cutting-edge technologies like nano science, is becoming an engine for local growth."

Han said he and his team hope to develop commercialized solutions based on FinFET, aiming to promote the technologies to the market in five to 10 years.

Li Lian contributed to this story.



Ye Yaoliang chisels at a large woodcarving in his studio. WANG RUIRUI / FOR CHINA DAILY