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Innovation center shines as beacon for Yangtze River Delta

Breakthroughs made in batteries for new energy vehicles

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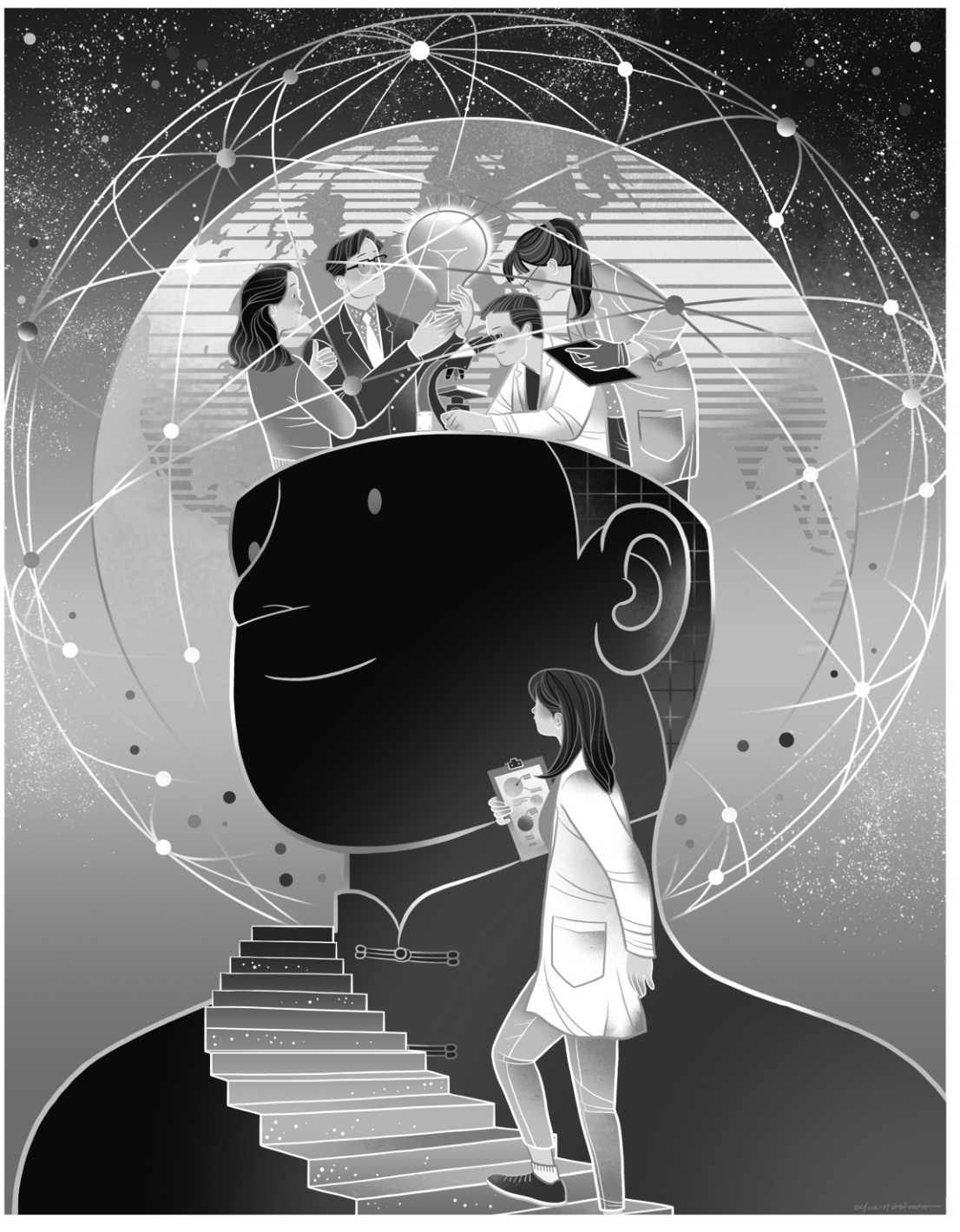


LI MIN / CHINA DAILY

A business incubation center in Ningbo city, Zhejiang province, is making giant strides in increasing the power density and lifetime of lithium batteries used in new energy vehicles.

Most of these vehicles use batteries with an energy density of 200 watt-hours per kilogram, while those used by Tesla are the best on the market and capable of delivering 250 W.h/kg.

But the Ningbo platform has produced batteries with an impressive 301 W.h/kg.

They contain graphene, weigh less than others but can achieve the same mileage. The batteries will soon be used for tests on cars produced by Geely, according to the Ningbo Graphene Innovation Center in Zhejiang. Geely is a Chinese multinational automotive manufacturing company with headquarters in Hangzhou, capital of Zhejiang.

The use of graphene can boost the power density the amount of power per unit volume and endurance of a lithium battery, which will solve the problem of low mileage in new energy vehicles, the center said.

Zhou Xufeng, a professor with the Advanced Lithium-ion Battery Engineering Lab at the Ningbo Institute of Materials Technology and Engineering affiliated to the Chinese Academy of Sciences, said, "We aim to mass produce batteries of 500 W.h/kg for automobiles between 2025 and 2030."

The institute, together with leading enterprises in the domestic graphene industry and other companies, founded the innovation center last year.

The center said strong scientific research backing from Shanghai, market demand in Zhejiang and beyond, and robust capital support made it possible for it to produce such eye-catching results in such a short time.

It is also committed to achieving breakthroughs in key technologies in the graphene industry and has produced and applied graphene in the fields of materials plastics and fibers, health products and wearable devices.

Experts said the center epitomizes the rich and diversified resources of the Yangtze River Delta region, and the area's high international profile is making it a heartland for scientific research in China.

Chen Yubo, a professor with the School of Economics and Management at Tsinghua University in Beijing, said, "Basically, Shanghai, the core city in the urban clusters in the delta region, provides intellectual support, and the vast market demand and capital enthusiasm in the other cities offer potential for industrialization.

"Meanwhile, different cities in the delta region have their individual industrial strengths — for example, manufacturing in Suzhou (Jiangsu province) and software for Hangzhou, which provides an ideal base for connecting research to industrialization in different cities," Chen said.

Wang Yanping, head of public policy and government affairs at LinkedIn China, said, "From the perspectives of talent flow and infrastructure connectivity, the Yangtze River Delta region has formed an intensive network of cities, which is unlike anywhere else in the country. It also provides a strong base for the region's output of scientific research."

The integrated development of the delta region was elevated to a national strategy, and its further integration is part of the blueprint to improve reform and opening-up announced by President Xi Jinping during the China International Import Expo in Shanghai in November.

The announcement signified that development of the region, which contributes more than 20 percent of GDP and is home to 10 percent of the country's population, will be fast-tracked.

Zhang Haohan, Party chief of the Jiangsu Federation of Social Science Association and director of the Yangtze River Delta Regional Joint Research Center, said, "In the light of Xi's strategic requirements and the report of the 19th National Congress of the Communist Party of China, the delta region will place more emphasis on innovation, including economic development and science and technology."

Lyu Yong, deputy Party head of the Zhejiang Institute of Advanced Technology in Jiaxing city, said that since 2004 the Chinese Academy of Sciences has played an indispensable role in the many scientific breakthroughs and their applications in the delta region. The institute is responsible to the academy.

"Private business is being developed in the delta region, but it is a part of the grassroots economy and lacks technical support for continued prosperity. CAS responded to the call to inject intelligence into local development," Lyu said, adding that the institute was established in 2004 and was the first joint venture between the academy and a Chinese city.

"CAS has made many technological achievements that can be industrialized, Jiaxing can provide the platform to transform research results, and the technologies can be exported to the delta and the country," he said.

Lyu added that 24 projects in fields such as communications, new materials, modern agriculture, and the green chemical industry, have been established and two unicorn enterprises in information technology and wireless sensing have emerged. A unicorn refers to any tech startup that reaches a $1 billion market value as determined by private or public investment.

Lyu said the institute has close connections with the 12 CAS branches in Shanghai, where 13 key State laboratories and more than 500 new research and development projects are set up annually.

"In the first half of this year, we invited 35 senior CAS experts from branches in Shanghai to our institute, and two contracts for joint venture projects were signed," he added.

You Jianhong, assistant to the director of the institute, said such collaboration and transformation has also spurred local economic development.

"Last year, the institute saw output value of more than 20 billion yuan ($2.9 billion) and tax revenue for Jiaxing that exceeded 1.7 billion yuan," he said.

Huang Zhengren, director of the Ningbo Institute of Materials Technology and Engineering, affiliated to CAS, said one of the reasons the institute was established in Ningbo was because industrial production materials account for a large proportion of the city's industries.

"At the same time, the institute has an enormous network, including the other CAS branches and complete industrial chains within the delta, as support," he said. Huang added that its clients include the Shanghai Microsatellite Engineering Center, the General Electric Co and other private enterprises throughout the delta region.

Advanced traffic network

Experts said the area's advanced traffic network is one important factor that has enabled researchers and entrepreneurs to integrate scientific research and innovation in different places within the region and achieve product breakthroughs.

Luo Dajin, deputy director of the Shanghai Municipal Science and Technology Commission, said 18 high-speed rail lines operate in the region, making it the country's most developed area in this form of transportation.

According to the China Railway Shanghai Group, 34 of the 41 cities in the region have high-speed rail links, and the construction of railways within the region will be maintained at a high level this year. Investment in these railways in the area accounted for one-sixth of the national total this year.

Luo said that last year more than 28 million trips were made on public transportation in 20 of the region's cities, including those in Jiangsu and Zhejiang provinces and Shanghai, by using travel cards from other cities in the delta region.

"The figure accounted for 80 percent of country's total for such payments, which illustrates the greater flow of people within the delta region," he said.

Yu Weiguo, director of the Jiaxing Optoelectronic Engineering Center at CAS, said he had traveled frequently between Jiaxing and Shanghai for project collaboration since taking up his job in 2013.

"More than 70 of our 700 or so employees come from Shanghai, and nearly 50 travel between the two cities every week," said Yu, a Shanghai native.

"For me, after all this time spent driving between the two cities, I find the time has been reduced, and it now takes only 90 minutes," he said.

Expert stresses 'core city' route for Shanghai

Further integrated development of the Yangtze River Delta region will help Shanghai better play a leading role in the area and even the entire country, according to an expert.

Despite its size, Shanghai still trails many of its overseas counterparts in terms of its function and contribution, experts said at the Yangtze River Development Think Tank Forum held in Shanghai late last month.

Zhang Haohan, Party chief of the Jiangsu Federation of Social Science Association and director of the Yangtze River Delta Regional Joint Research Center, said New York contributes 24 percent of the United States' GDP, Tokyo 26 percent of Japan's, London 22 percent of the United Kingdom's, and Seoul 26 percent of South Korea's.

"But the ratio for Shanghai is lower than 4 percent — a staggering distance behind its foreign counterparts," Zhang said during the form at Fudan University.

"Moreover, the proportion of Fortune 500 companies headquartered in Shanghai is only 10 percent of that in New York. Expatriates account for just 0.9 percent of Shanghai's permanent residents, while the proportion for an international metropolis is usually 10 percent," he added.

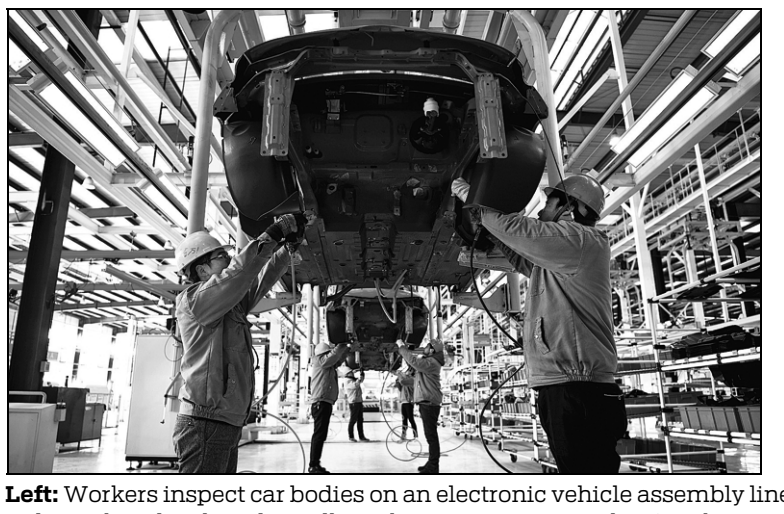
Zhang said a "reasonable way" for Shanghai to improve its function is to emphasize the construction of the "core city" while integrating the Yangtze River Delta region to make the development of Shanghai and the rest of the delta mutually beneficial.

Zhang said his research showed that such a route is in line with the development of other world-class urban centers, such as New York, London and Tokyo.

Shanghai is at a stage where its division of functions with neighboring smaller cities has been established and traditional industries are being transferred outside the city, Zhang said.

"What is expected in the next stage, based on the experience of other urban centers, is that the city cluster will lead development of the country's other city clusters. At the same time, the core city with its outperforming comprehensive and international service functions will play a bigger leading role," he said.

— ZHOU WENTING



Left: Workers inspect car bodies on an electronic vehicle assembly line in Rugao, Jiangsu province. LI CUNGEN / XINHUA **Right:** The graphene industry has developed rapidly in the Yangtze River Delta. Graphene is used in the fields of materials plastics and fibers, health products and wearable devices. ZHONG MIN / FOR CHINA DAILY

FIRST PERSON

Boss who returned to China hails progress made in Zhejiang

***Jin Xing,** chairman of Zhejiang Autorock, a company specializing in the research and development and production of liquid crystal auto panel boards*

Having obtained permanent residency and a decent income in the Netherlands after working there for more than a decade, I decided to return to China, hoping to take research results out of the laboratories and apply them to people's daily lives.

I worked at the Shanghai Institute of Microsystem and Information Technology, affiliated to the Chinese Academy of Sciences, for three years from 2011 before resigning to establish my own business.

The company was formed in Hangzhou, capital of Zhejiang province, in 2014. It is a joint venture set up by the Shanghai Institute of Microsystem and Information Technology, Hangzhou Linjiang Investment Development Co and my entrepreneurial team.

> "Looking back on the five years of development, I believe that these features made the startup boom possible and made it difficult to be replicated elsewhere."
>
> **Jin Xing,** chairman of Zhejiang Autorock

I chose Zhejiang because of the widespread scientific research collaboration within the Yangtze River Delta region, the deep-rooted environment for entrepreneurship and the talent reservoir in neighboring Shanghai.

Last year, the Zhejiang government listed integrated circuitry as a key industry. The local government's forward thinking made the transformation of scientific research results easier.

Looking back on the five years of development, I believe that these features made the startup boom possible and made it difficult to be replicated elsewhere.

Fourteen domestically produced new energy vehicles were displayed at the Shanghai auto show in 2015, and the auto panel boards in seven of them were produced by my company.

To date, our auto panel boards have been used on cars produced by nine domestic manufacturers.

Our plans involve making the dashboard appear very similar to a plane cockpit, with many screens.

The plans are being researched and developed and we estimate they will take three to five years to come to fruition.

— ZHOU WENTING