RECONNECT CHINA

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New quality productive forces "according to local conditions" – regulatory and planning aspects

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Executive summary:

This policy brief critically examines the concept of "New Quality Productive Forces According to Local Conditions" (NPF) which aims to optimise resource allocation and foster technological advancement, thereby positioning China as a global leader in innovation. This approach seeks to address inefficiencies resulting from the neglect of local advantages and to channel innovation resources into strategic growth clusters.

The NPF approach is based on China's longstanding division into three economic macro-regions, assigning coastal provinces the task of spearheading technological innovations, while central and western regions play supportive roles. Yet, in a novel move, the NPF introduces new mechanisms of "differentiated development paths" and "classified guidance" to enhance the redistribution of national resources toward high-quality development. Existing innovation hubs will acquire more resources and support, but in less developed inland areas, new manufacturing hubs can be expected to emerge.

A case study of Chengdu illustrates how the city has leveraged its local characteristics and advantages to align with the NPF approach. Chengdu's plans emphasise agriculture, science, and technology, with a particular focus on cutting-edge fields such as artificial intelligence and microchips. These efforts are underpinned by substantial infrastructure projects and a competitive environment for future industries.

Overall, the NPF strategy's emphasis on local conditions appears as a more resource-efficient and pragmatic alternative to previous plans. However, challenges persist, including regional inequalities and persistent bottlenecks in policy implementation. The ultimate success of this strategy will depend on its detailed execution in the forthcoming 15th Five-Year Plan.

Policy recommendations:

To effectively respond to China's increasingly targeted and regionally differentiated approach to science, technology, and innovation (STI) development, the European Union should consider the following strategic actions:

- Deepen understanding of China's evolving regional development strategy, which emphasizes a more selective and uneven

distribution of STI resources, to better anticipate shifts in innovation dynamics.
- Increase public and private investment in science and technology across the EU to remain competitive in light of China's substantial support for emerging innovation hubs.
- Facilitate access for European enterprises to inland Chinese regions by identifying and promoting opportunities in newly emerging innovation and manufacturing centers to leverage local comparative advantages.
- Expand analytical capabilities to assess the effectiveness of STI policy implementation at the local level in China, with a focus on identifying efficiency gains and the phasing out of outdated or inefficient practices.
- Ensure that European firms, research institutions, and policymakers are well-informed about the priorities and regional implications of China's upcoming 15th Five-Year Plan (2026–2030), enabling them to proactively navigate diverse opportunities and challenges in cross-border science–business collaboration.

INTRODUCTION

China's spending on innovation-driven development has increased dramatically, but distorted policy implementation has significantly weakened the impact of investments. The combination of generous funding and inadequate coordination has led to immense waste of resources. The policy of "new quality productive forces according to local conditions" (NPF), which aims to mobilise and redistribute the country's resources towards technological breakthroughs, seeks to tackle wasteful practices. Rooted in Deng Xiaoping's 1988 concept "Science and technology are primary productive forces" and rephrased by Xi Jinping in September 2023, the NPF concept was included in the Resolution of the milestone third plenary session of the 20th CPC Central Committee in 2024, making it a key development approach.

While there has already been much discussion about the meaning and rationale of the "new quality productive forces", the latter part of the concept "according to local conditions" (因地制宜) remains less analysed. The logic behind the concept assumes that negligence of local conditions and advantages in decision-making is a major reason for inefficient allocation and use of resources. Furthermore, in the current geopolitical climate, China's leaders want to channel innovation resources into growth clusters that are expected to deliver breakthroughs in strategic technologies, rather than into obscure county laboratories.

This policy brief explores how China's leadership aims to optimise resource allocation with a focus on local conditions and how we can assess the efficiency of this policy. Understanding the regional aspect of the new policy concepts offers important insights for European companies and policymakers about the regional dimensions of China's new science and innovation strategies and their viability. How are China's vastly diverse regions advised to define and elevate local conditions in their science and technology plans, and what consequences may this have for China's innovation capacity?

After deciphering "local conditions" in China's previous science regulations, plans, and policies, this policy brief provides an analysis of new features in China's R&D development strategy, focusing on Chengdu, a city in Western China that has recently emerged as a focal point within national strategic development agendas.

"LOCAL CONDITIONS" IN CHINA'S REGULATIONS AND PLANS

Since the mid-1980s, China's regional development policies have been based on the division of the country into three larger economic regions: coastal areas, central, and western China. Each of these macro-regions has its own typical "local conditions" that define their main role in the national division of labour for economic and social development. The new NPF strategy follows the three-regions division, assigning coastal provinces the lead in driving scientific and technological innovation, while central and western regions take on a supportive role. Complementing this macro-level division of labour, lower levels of administration are responsible for defining and responding to local conditions. As will be discussed

later in this paper, new policy documents urge administrative units down to the county level to define local comparative advantages (地方比较优势) and local specific features (地方特色) in a pursuit to improve productive forces.

In China's economic and science strategies, attention to policy adaptation according to "local conditions" is not a new issue. Already during the early reform period in the 1980s, local conditions and specific features were occasionally referred to in science and technology policy documents, which is indispensable for a vast country like China[1]. Since 2006, when science and technology gained more emphasis in national development plans, all key documents are based on the division of labour between the three macro-regions, and call for attention to local features in policy implementation. The five-year and longer-term plan for science and technology (2006–2020) advised localities to promote the construction of regional innovation systems with different characteristics and complementary advantages. The following decade, "The Opinions on Deepening the Reform of the Science and Technology System and Accelerating the Construction of the National Innovation System" (2012) and "The Outline of the National Innovation-Driven Development Strategy" (2016) dedicated specific sub-chapters to the building of regional innovation development mechanisms.[2]

The process of turning China from the world's factory into an innovation-driven technology powerhouse gained momentum with the start of the Sino-US tech war and major breakthroughs in the development of Artificial Intelligence. The development of science and technology replaced GDP growth as a priority in China's grand strategy.

Under the sense of national urgency, China escalated its science and technology investments to reach self-sufficiency in critical technologies and to gain a leading position in global technology development. From 2018 until 2024, the country's research and development expenditure grew by 84%.[3] The rapid growth was supported by "The Guiding Opinions on Promoting the Development of New Types of Research and Development Institutions" that the Chinese Ministry of Science and Technology issued in 2019.[4] The document urged local governments to facilitate the construction and operation of R&D institutions supported by the allocation of special state funds. Seizing these newly available resources, localities across the country moved swiftly to establish new R&D institutions. Driven by a sense of urgency, the process lacked proper coordination, resulting in significant resource waste—such as the construction of new centres and infrastructure without adequate personnel or integration with local economies. The situation sparked debate among Chinese researchers who demanded better coordination and control of the process.[5]

Leaders also took note of the highly wasteful outcomes caused by rushed investment decisions and inadequate planning. This, among other factors, prompted the Party-state to tighten top-down control over innovation policies in the spirit of the "New Whole Nation System" that was adopted in the 14th Five-Year Plan (2021–25) to mobilise all resources in a comprehensive manner for the global tech battle. However, this new approach did not imply that all localities should focus on technological breakthroughs. On the contrary, only those with the appropriate conditions were expected to pursue cutting-edge innovation, while others were assigned a supportive role based on their own strengths and comparative advantages.

A stricter locally-adjusted approach can be identified in the 14th Five-Year Plan of Science and Technology (2021–2025). While the national version is not publicly available, the local versions reveal that localities were urged to systematically strengthen comparative advantages to serve national strategies.[6] Furthermore, highlighting the need for better regional coordination and planning, a completely new chapter "Regional Scientific and Technological Innovation" was added to "The Law for the Advancement of Science and Technology" during the process of its revision. The final version, which came into effect in January 2022, clearly required local governments—down to the county level—to align their innovation efforts with local conditions and to prioritise the development of regional science and technology clusters.[7] This development culminated in the adoption of the "New Quality Productive Forces According to Local Conditions" concept.[8]

A new categorisation of regional division of labour was defined to optimise resource distribution to major tasks. The main responsibility for future breakthroughs was placed on the three coastal growth hubs (Greater Bay Area around Guangzhou, Yangtze River Delta around Shanghai, Beijing-Tianjin-Hebei region), the western Twin City Region (Chengdu and Chongqing), and selected second-tier cities such as Wuhan and Xi'an. (See map 1) Those localities that do not have adequate conditions for innovations in advanced

Map 1: China's four growth hubs

Source: CEAS, Botagoz Kazhibekova

technologies were instructed to upgrade the manufacturing industry and improve the efficient utilisation of natural resources. The state provided classified guidance for all regions to promote productivity reform along differentiated paths. In this context, "Whole Nation System" means a system in which each region mobilises its own resources in accordance with local conditions under the classified central guidance to support China's struggle for global science leadership.

WHY "LOCAL CONDITIONS"?

Based on authoritative clarifications on the meaning and rationale of the "New Quality Productive Forces According to Local Conditions,"[9] the new approach aims to resolve the following deep-rooted problems in local-level science and technology policy implementation:

- Detachment from local realities and conditions
- Believing in a "one-size-fits-all" approach
- Herd mentality in following the trends of what other cities do
- Rushing into projects seeking quick success without proper planning and coordination
- Poor local integration between science, technology, and industry

China's leadership wants to put a stop to "white elephant" projects that create magnificent but, in the end, useless science parks and research centres. In addition, they want to prevent provinces and localities from investing in the same key technologies, a common practice that has created disorderly inter-provincial competition and production overcapacity. The central government now requires localities to promote local comparative advantages that are selected after careful consideration and regional coordination.[10]

Similar challenges have also been identified in academic research on regional science policy implementation in China. Interviews conducted by Heindl[11] in 2018 with local policy experts in Yunnan province and Chongqing, a province-level municipality, revealed that innovation policies of that time were difficult if not impossible to implement due to several reasons. The policies were mainly designed to promote selected strategic fields in coastal regions and lacked clear guidelines on how the less developed regions with nationally less-relevant research foci should put the policies into practice. In the absence of a developed innovation environment, particularly due to the scarcity of resources, innovation policies remained mainly at the level of theoretical expectations. Based on Chinese firm-level data for 2001–2011, a study by Boeing and Peters confirmed that firms located in less developed inland provinces were generally less likely to receive R&D subsidies. In addition, they showed that it was easier to misappropriate R&D funding in regions with weaker innovation ecosystems that lack conditions for meaningful projects. Overall, a staggering 42% of all grantees misused R&D subsidies, accounting for over 50% of total R&D subsidies in China.[12]

The local policy experts in Yunnan and Chongqing criticised innovation policies for being only for the sake of the nation, not the local economy. They emphasised the need to find their own local paths and stated that locals are able to plan more appropriate strategies than the centre. Still, they expected the central state to take the lead in the creation of local innovation environments. Overall, at that time in Yunnan and Chongqing, industrial development was regarded as more important than innovations.[13]

These observations shed more light on the bottlenecks in the implementation of innovation policies and add two more issues to the above-mentioned five-point list of problems in policy implementation: corruption, and top-down policies that tend to be inflexible and ignorant of local conditions.

A comparison between the new NPF guidelines and policy expert perspectives in Heindl's study suggests that certain aspects of the strategy are on the right track, reflecting a more genuine commitment to local conditions. Before drawing conclusions on the efficiency of the new strategy, let us first look at its implementation measures.

"DIFFERENTIATED DEVELOPMENT PLAN" WITH "CLASSIFIED GUIDANCE": WHAT AND HOW

How will attention to local conditions help to reach the goals of the NPF approach? The plan is to create differentiated development paths for each locality based on their current level of development, local features, and comparative advantages.

Development level

Previously, the regional division of work was primarily aimed at GDP growth. However, now it has been redirected to support "new productive forces", which in practice means advancing technological innovations. The most developed coastal provinces have been given the advantage of fast-tracking the development of globally competitive innovation ecosystems. In contrast, the rest of the country—aside from certain urban clusters—has been tasked with upgrading industrial and manufacturing sectors while laying the groundwork for future innovation-driven development

In an article published by the influential National Development and Reform Commission, the Western region was characterised as resource-base with a relatively underdeveloped industrial foundation. The article proposed that the region should focus on developing local industries, enhancing the efficient utilisation of resources, and fostering new drivers of economic growth.[14] To some extent, this reflects the aspirations of policy experts from the Western regions in Heindl's study, as it relieves them of the obligation to channel local resources into innovation and instead encourages the formulation of region-specific development priorities in industry and manufacturing. These measures can be expected to create new conditions for strengthening manufacturing capacities in the region. However, given the persistent and widening development disparities between coastal and inland areas, such a policy may ultimately exacerbate regional inequalities. As noted by Breslin and Ren, the areas that are dependent on old industries will likely feel significant pain.[15]

Comparative advantage and local characteristics

Alongside the level of economic development, local characteristics and comparative advantages are also taken into account when determining each locality's development position. Comparative advantage refers to the relative advantage of a region compared with other regions, both domestically and globally. An article published in the *People's Daily* in August 2024 cited Xi Jinping saying that all regions must find their own position and comparative advantages in the domestic and international dual circulation. The article further described comparative advantages as differences in resource endowment, local characteristics, ecological environment, development conditions, and development levels. However, it explained that localities are not destined to one position in the classification, but can open up new areas and enhance their comparative advantages. Here the province of Guizhou—one of the poorest in China—was given as an example as it has developed into a global data centre hub thanks to its advantageous natural conditions.[16]

The central government pledged to offer "classified guidance" to localities in formulating development programmes tailored to their specific conditions. In

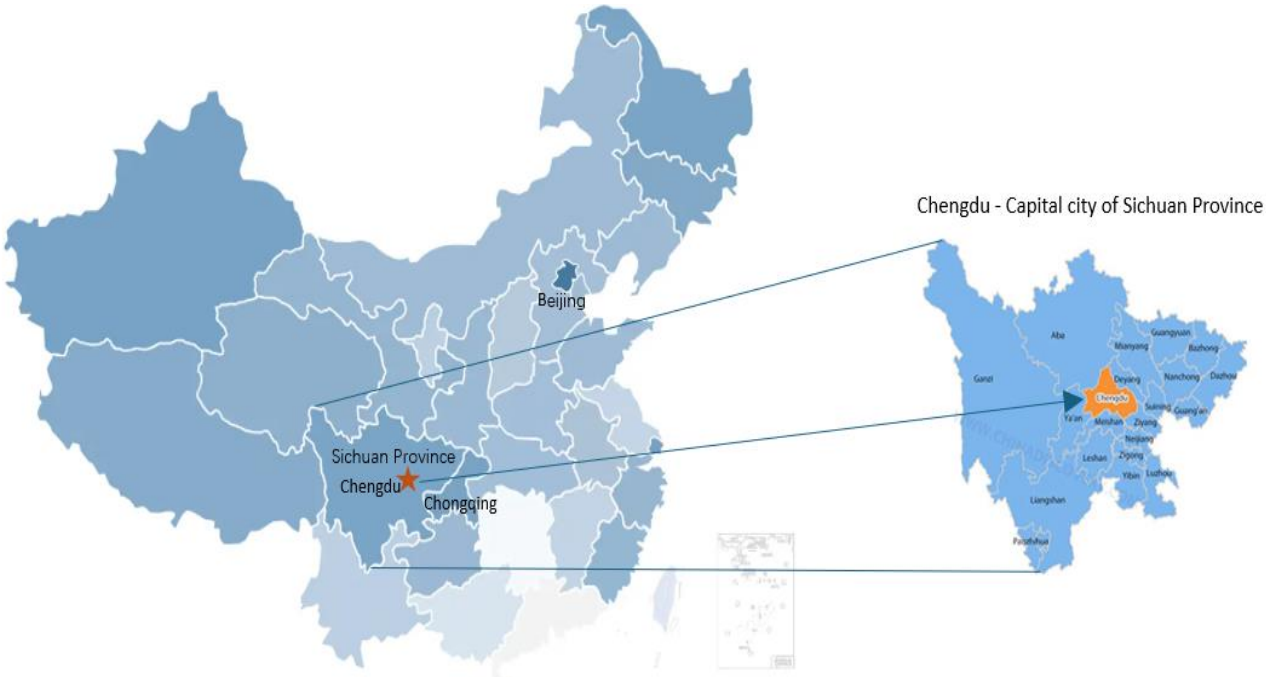
practice, this involves first classifying regions according to their capacity to contribute to the development of new productive forces, followed by providing guidance for drafting policy implementation guidelines based on this classification. At the time of writing, there are no documents available online on the details. The guidelines for classified guidance will eventually be published in connection with the 15th Five-Year Plan (FYP) for the years 2026–2030. A key issue concerns the balance between top-down imposition of the development path and the autonomy granted to localities in designing their own differentiated development strategies.

LOCAL CHARACTERISTICS AND ADVANTAGES IN CHENGDU

Located in the western part of China (See Map 2), the city of Chengdu provides an interesting case to explore how the local features have been defined and used in local science and technology policy. Chengdu is the capital city of Sichuan province, with a resident population of over 20 million. In 2019, Chengdu together with neighbouring Chongqing was designated by the state as a new growth region alongside the three other hubs spreading around Guangzhou, Shanghai, and Beijing. According to the strategy, the twin city region will lead innovation-driven development in western China.

Among the top provinces in 2025, Sichuan has set the most ambitious GDP growth target (see Table 1), with Chengdu playing a central role in driving this momentum. The city's innovation environment has seen rapid improvement in recent years, as reflected in various rankings. This progress is further supported by Sichuan's comparatively well-managed investment environment, which strengthens the province's overall growth prospects. According to Boeing and Peters' study (2022), Sichuan was among the less corrupt provinces in China—the share of misappropriating firms was lower than the national median.

Map 2: Location of Chengdu– capital city of Sichuan Province



Source: Innovation Norway.

Note: Chongqing was part of Sichuan province until 1997, when it became a municipality directly under the central government because of the Three Gorges Dam project. Chengdu and Chongqing together create the Cheng-Yu (成渝) urban agglomeration (Yu "渝" is an abbreviation of Chongqing).

Two methods were used to identify what Chengdu has defined as local characteristics and advantages. The analysis is based on documents that are available online. Firstly, we have analysed key documents on Chengdu's science and technology development since 2006. Secondly, we applied semantic network analysis (SNA) on a dataset of news and documents published on the website of the Chengdu municipality's Science and Technology Bureau between January 2018 and October 2023. [17] SNA is a computational text analysis technique that is designed to identify discursive patterns formed by words and their interactions.[18] Our networks comprise the fifteen

Table 1. Major economically developed provinces' targets of GDP growth in 2025.

Province	GDP 2024 (trillion CNY)	GDP Growth in 2024	GDP Growth Target of 2025
Guangdong	14.16	3.5%	= 5%
Jiangsu	13.70	5.8%	> 5%
Shandong	9.86	5.7%	> 5%
Zhejiang	9.01	5.5%	≈ 5.5%
Henan	6.36	5.1%	≈ 5.5%
Sichuan	6.47	5.7%	> 5.5%

Note: The top 6 major economically developed provinces' GDP covered over 45% of China's GDP in 2024.

most significant words that co-occur with the keywords "characteristics" (特色) and "advantages" (优势) and their fifteen most significant co-occurring words.[19]

The semantic network analysis revealed that the term "characteristics" shows strong associations with agriculture, and particularly Chinese herbal medicine. Clusters of associated words indicate the importance of basic academic research and experiments in locally typical medical herbs and genetics. The strong focus on agriculture and botany can be explained by fertile land and rich biodiversity in Sichuan province. A similar exercise with the term "advantage" produced more variation with regard to sectors: advantages were clearly divided into agricultural sciences and knowledge-based industries.

Reading official policy documents, Chengdu's 14th science plan (2021–2025) [20] used the term "characteristics" sparingly, mostly in connection with agriculture. Building a modern and efficient specialty agricultural belt was mentioned several times. The term "advantage" was solely connected with science and technology, emphasising the innovation advantage created by the city's numerous universities and research centres. The plan mentioned local fields of science that already ranked among the top 20 globally: communication engineering, biomedicine, instrumentation science, transport, and mining. Local fields of industry that were characterised as advantageous were information technology and materials science.

In general, the FYP emphasised aerospace, information technology, rail transport, petrochemical engineering, and manufacturing. All of these sectors can be regarded as local strong fields because they received substantial funding during the 1960s due to the Third Front policy, which concentrated strategic industries and research institutions in inland China to shield them from potential military attacks by the Soviet Union or the US.

Besides strengthening these old industries, the 14th Science and Technology FYP also emphasised new

cutting-edge technologies and future industries that were high on the national agenda, such as artificial intelligence, microchips, blockchain, and 6G. The work plan for 2022 further placed the task of identifying 15 new fields in which Chengdu could act as a "first mover". These plans were placed within the "Created in Chengdu" branding strategy.

The FYP, as well as the 2021 outline of the Twin City Cooperation Plan, listed massive infrastructure projects such as several new science parks and development areas. In addition to these new areas, the Chengdu city government encouraged all district and county governments to actively compete in the cultivation of future industries.[21]

Once the NPF concept was included in the resolution of the Communist Party, Chengdu was quick to produce responses strictly in line with the new approach. [22] A more comprehensive and detailed outline of Chengdu's local advantages is listed in the City government's 2024 work report, which delineated a new 9+9+10 strategy[23] of nine characteristic and advantageous industry clusters, nine emerging clusters, and 10 future fields, covering the earlier mentioned sectors. The development of these industrial clusters will, in practice, be concentrated within various science parks.[24]

Based on this short overview of innovation policy localisation in Chengdu, does attention to local conditions provide efficient support for Chengdu to contribute to the national goals? It seems that Chengdu is well able to develop and implement a localised NPF plan according to local conditions. It has a thriving local industrial base and agricultural sector, as well as globally competitive universities and research facilities. Chengdu, like many other cities, invests in the development of cutting-edge technologies. However, as a designated national-level growth hub, it need not apologise for exhibiting a herd mentality—it is mandated to do so. However, the massive infrastructure projects outlined in the development plans raise imminent concerns about the construction of science parks that may struggle to attract talented personnel. Can this Western city truly draw gifted researchers and entrepreneurs, both domestic and international?

At a general level, the NPF approach appears more resource-efficient and pragmatic than previous policies, as it promises greater emphasis on adapting to local conditions. The specifics are likely to be clarified in the forthcoming 15th Five-Year Plan, accompanied by subsequent regulations and guidelines. However, longstanding bottlenecks in the central–local policy implementation process remain difficult to overcome, as evidenced by earlier challenges.

POLICY RECOMMENDATIONS

1. Enhance strategic intelligence on China's regional STI priorities
2. Strengthen EU STI investment to maintain competitiveness
3. Support European industry engagement in emerging inland innovation and manufacturing clusters
4. Improve monitoring and evaluation of China's local STI policy implementation.
5. Promote awareness of China's 15th Five-Year Plan among EU stakeholders

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Note: The policy brief was prepared in 2024, with its first draft submitted in the end of the year. Adjustments had been made based on discussions through partners in early 2025.

ENDNOTES

[1] For example: Ministry of Agriculture, Livestock and Fisheries(1985) 农牧渔业科学技术情报工作条例 [Regulations on Scientific and Technological Information in Agriculture, Livestock and Fisheries]. Available at pkulaw.com.

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[17] The documents were published under the headings of "district and county science and technology" (区县科技) and "work briefing" (工作简报). To ensure that the data serves our interests, we filtered the relevant texts using the keywords "characteristics" (特色) and "advantages" (优势) and omitted references to "Chinese characteristics" (中国特色), which refers to national characteristics. This resulted in 129 documents for "characteristics" and 139 documents for "advantages". The data was originally collected by our Reconnect China consortium partners at the Universität Wien. We would like to thank them here for generously sharing their data with us.

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[19] Here, we measured interaction by statistically significant co-occurrences. For significance, we used different test scores to explore different kinds of associations. The results reported here are based on the (statistically significant, Bonferroni corrected) Chi-square test and an association measure formulated by Stefan Gries. See: Gries S.T. (2022) What do (some of) our association measures measure (most)? Association? *Journal of Second Language Studies* 5(1),1–33.

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[23] The "9+9+10" modernised industrial system refers to nine characteristic and advantageous industrial clusters: electronic information, equipment manufacturing, medicine and health, new materials, advanced energy, green food, modern finance, trade and logistics, and cultural tourism; nine strategic emerging industrial clusters: integrated circuits, new display, artificial intelligence, intelligent networked vehicles, aerospace, rail transportation, low-altitude economy, biomedicine, and green hydrogen energy; and 10 future industrial fields: humanoid robots, flying cars, commercial aerospace, next-generation mobile communications, brain-computer interfaces, swarm intelligence, quantum technology, cell and gene therapy, advanced nuclear energy, and cutting-edge new materials.

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