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CHINA'S INNOVATION ECOSYSTEM

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Foreword

After decades of being able to take technological cooperation with China at the corporate, academic, and political levels for granted, the last few years has seen a shift towards more critical viewpoints of such engagement in the capitals of liberal market democracies from Europe to Japan to the United States. As technology becomes an increasingly central point of friction between Europe and China, it is imperative to hone a sharp understanding of the role that European companies play in China's innovation ecosystem. This report aims to help fill in this knowledge gap and maps out examples of the kinds of research and development (R&D) footprints that various European companies have in the China market, as well as implications for the business community and policymakers.

For European companies, understanding how to maximise the value of China's vibrant innovation ecosystem is imperative, but so too is mitigating the risk of technology leakage. Meanwhile, European policymakers should take into consideration both the positive effects on European competitiveness that its companies are deriving from the market as well as the potential pitfalls that may lie in wait for prominent European companies that pursue excessive integration with, and facilitate technology transfer to, a market that is viewed simultaneously as a competitor and a systemic rival.

We would like to thank the German Federal Ministry of Education and Research (BMBF) for their support of this project (as part of the grant under funding reference number 01DO21014B), as well as the European Union Chamber of Commerce in China's (European Chamber's) members that completed the survey and took part in the in-depth interviews that underpin the findings of this report. Furthermore, for completing the research and writing of the report, we thank the European Chamber secretariat and MERICS' researchers, Jeroen Groenewegen-Lau, head of Program for the Science, Technology and Innovation Policy Team, and Jacob Gunter, senior analyst of the Economic Research Team. Finally, a note of appreciation for the support and feedback of other partners under this BMBF project consortium: Prof. Dr Jörn-Carsten Gottwald, professor for East Asian Politics at Ruhr University Bochum, and Prof. Dr Markus Taube, director of the IN-EAST School of Advanced Studies at the University of Duisburg-Essen.

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Background

To better understand China's innovation ecosystem, European companies' innovation priorities, and the related opportunities and challenges identified by European companies in the China market, the European Union Chamber of Commerce in China (European Chamber) and the Mercator Institute of China Studies (MERICS) invited members of the European Chamber's Research and Development Working Group and the Advisory Council to participate in a survey (32 respondents) and interviews (11 interviewees). The findings are not meant to represent the whole of European business in China, but instead offer a sample of the current ecosystem and an in-depth look at how some companies interact with it.

This report is the result of that research. It is one part of a series of projects supported and funded by the German Ministry of Education and Research, and is done in collaboration with the European Chamber and MERICS, along with input from partners at Ruhr University Bochum (RUB), and the University of Duisburg-Essen (UDE).

Note

The survey and interviews were primarily conducted in December 2021 and January and February 2022, prior to the major Omicron outbreaks and subsequent lockdowns across China in March and April. While the European Chamber has noted a significant downturn in business sentiment as a result of the lockdowns, it is not possible to know at the time of writing the impact they have had on European companies' innovation strategies in China.

Essential takeaways

- Most respondents find considerable value in participating in China's innovation ecosystem, and are keen to expand research and development (R&D) activities and further integrate them with their global strategies to make the most of China's strong talent pool, its speed of commercialisation of new technologies, and the potential of combining European hardware excellence with Chinese software expertise.
- Respondents in sectors where China is encouraging investment and onshoring—like chemicals, industrial machinery and automotive—are mostly going 'all-in' – increasing their R&D investments in China and maximising the value they can derive in the market for their local offerings and global ones.
- Others that enjoy open markets or even the red-carpet treatment are taking a 'hedged bets' approach – maximising the value of a large R&D footprint in China while keeping core technology and innovation in their home markets to limit leakage.
- Firms in sectors under increasing pressure from China's state-planners, such as in information and communications technology, are the most pessimistic, and their R&D strategies reflect the diminishing and lacklustre opportunities they can find in a regulatory environment that no longer needs or wants them competing against national champions.
- Key recommendation for companies: As is always the case for foreign companies considering their position in China, firms should first map their current and future positions against Beijing's strategic goals, then determine how to maximise the opportunities of a vibrant innovation ecosystem while minimising the leakage and theft risks that may result from having a larger or more comprehensive R&D footprint in the market.

China's Innovation Ecosystem:
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Key findings, analysis and context

European companies recognise that China's R&D ecosystem is increasingly vibrant and has many advantages over the rest of the world. Among the advantages most commonly cited was the number and variety of collaboration partners, which ranged from established national champions to companies that are part of China's vibrant start-up ecosystem as well as inventive scientists and researchers. Survey respondents also widely praised the size of the market (68%) and the fast pace of commercial application of R&D results (68%).

Respondents report increasingly high integration between their China-based innovation work and their global efforts. Participating companies also noted the mature nature of their China-based R&D activities, with a majority using their local innovation capacity to refine existing products, as well as to create new goods and services alongside new business models and operational improvements. This stands in contrast to the early days of European companies doing innovation in China almost exclusively for localisation of products developed in home markets.

While positive factors were considerably more common among respondents, some negative aspects emerged as well, including: weak intellectual property rights (IPR) protection systems (32%); an unlevel playing field for foreign companies (27%); negative sentiment in companies' home markets towards R&D in China (23%); and insufficient local talent (18%), which specifically referred to challenges in finding suitable hardware engineers, as reported by many of the interviewees.

Those that reported unequal access to government support (82% of respondents) noted several causes, including: opaque or unclear application information/processes for accessing grants and subsidies (58%); administrative challenges not faced by local companies (42%); support schemes that are not publicly announced, but communicated only to local companies (37%); and explicit rules preventing foreign companies from accessing support (26%).

However, while participants in both the survey and interviews held positive overall views on doing innovation work in China, the benefits that European companies can derive from their participation very much depends on the sector they are in. The potential opportunities and rewards of participation must be soberly weighed against the associated risks. In other words, China's R&D environment is a microcosm of its overall market – it is not for everyone.

In that sense, the generally positive findings of the surveys and interviews must be viewed in the context of the industries that are the most represented in this study's limited sample size, which are chemicals (29% of total respondents), automotive (13%) and machinery (16%). These industries are ones in which European companies have experienced considerable success in the China market and enjoyed improved market access and increasingly favourable conditions in recent years. In fact, these same industries were identified in the early 2021 joint report by the European Chamber and MERICS, *Decoupling: Severed Ties and Patchwork Globalisation*, as falling into 'business class' and 'economy class' in China – i.e., those that receive the red-carpet treatment or are at least welcomed to contribute to China's economy.[1] Meanwhile, industries languishing in the 'cargo hold'—like information and communication technology (ICT), telecommunications and all things digital—find themselves increasingly squeezed out of the market, and are struggling with local R&D as a result.

1 *Decoupling: Severed Ties and Patchwork Globalisation*, European Union Chamber of Commerce in China and MERICS, 14th January 2021, viewed 19th April 2022, <https://www.europeanchamber.com.cn/en/publications-decoupling>

Business and economy classes: market forces and politics see companies opt for either 'all-in' or 'hedged-bets' strategy

Those in the business and economy classes contributed to several positive results in the European Chamber's *European Business in China Business Confidence Survey 2021*.[2] That survey reported the lowest desire to leave the China market on record (9%, down from 22% a decade ago), and found that five times as many companies were seeking to onshore some or all of their supply chains compared to those seeking to offshore some or all of their supply chains. As noted in that survey, this is driven by both market forces and political forces.

Market forces and incentives and incentives pull European R&D into the China market

The market forces steering onshoring and localisation strategies are strong and apply to many companies that have a growing desire to increase their innovation footprint in the China market, as reflected in this survey. To compete successfully in China, European companies need to increasingly tailor their products to meet the requirements of highly-demanding Chinese consumers,[3] which requires local R&D.

This has driven many firms to up their R&D budgets locally. Despite R&D-spending declining in Europe since the pandemic began, spending increased in China operations for 73% of respondents, and is expected to increase further in 2022 for 77% of respondents. This level of spending means that for many larger companies, government incentives and grants do not have a major influence on their R&D decisions. Simply put, the government support available amounts to such a small percentage of their total R&D spending that the conditions that must be met, and the often-complex application procedures, mean it is not worth the effort – only 19% of respondents reported that they had accessed R&D/innovation grants.

One notable exception for many is China's High and New Technology Enterprise (HNTE) status, which has been conferred on 57% of respondents. While applying for it is administratively burdensome (an annual review and a tri-annual renewal are required), and there is also a need to show proof of continually working on 'new' technology, HNTE status is considered desirable as it drops the corporate tax rate from 25% to 15%.

Market forces are also a chief driver of where larger companies locate their R&D centres. Multinational companies (MNCs) are most likely to establish R&D centres in cities that can offer a more open business environment in general (such as Shenzhen or Shanghai), while also being close to their customers and operations. Meanwhile, only 28% of respondents reported benefitting from a presence in China's growing number of special innovation zones. Interviewees acknowledged the potential benefits—such as subsidies and favourable tax policies—that are often offered by special zones, but recognised that these must be weighed against the costs of isolating their R&D operations from the rest of their China operations. However, the sole interviewed small and medium-sized enterprise (SME) noted that incentives and subsidies are naturally more influential in their R&D decision-making processes, and they are more likely to take advantage of the kind of preferential treatment that special zones can provide.

Political forces push European companies to onshore and localise R&D

For companies in the business and economy classes, there is a growing political need to localise their value chains and more of their innovation capacity. When asked about their justification for investing in R&D in China, 29% of respondents said it was mostly due to business interests, but also due to government pressure and/or incentives, and 5% said it was mostly due to government pressure and/or incentives, but also due to business interests. While still a minority of respondents, it is nevertheless a worrying sign that even the overwhelmingly optimistic sample size of this survey notes the impact that political pressure can have on foreign companies operating in China.

2 *European Business in China Business Confidence Survey 2021*, European Union Chamber of Commerce in China, 8th June 2021, viewed 19th April 2022, <https://www.europeanchamber.com.cn/en/publications-archive/917/Business_Confidence_Survey_2021>

3 68% of survey respondents value the strong local demand for their innovative goods/services..

Political pressure to onshore operations, including R&D, is done both to mitigate the impact of cross-border disruptions (like the United States (US)-China trade and technology wars), and to suit China's increasing drive to localise as much as possible. Such pressure manifests most prominently through official demands from China's cybersecurity regime in sectors falling under the umbrella of critical information infrastructure (CII), as well as through unofficial expectations for 'autonomous and controllable' value chains, which increasingly is defined as including localised R&D that will not be subject to foreign export controls or sanctions. In addition, decisions to onshore are also being influenced by China's divergence from international technical regulations and standards. Such pressure acts as more than just guidelines or recommendations, it can often constitute the conditions for doing business in the market – 32% of respondents reported that they made R&D investments "in order to meet government requirements/ meet political criteria to obtain business licences, market access, approvals."

These trends are currently driving even the most welcomed and successful European companies in China to expand their local innovation work. What is significant is that a rift is beginning to appear between the current R&D strategies of surveyed companies—all of which reported deep (55%) or moderate (45%) integration of their China R&D and global innovation work—and their future outlooks. When discussing the growing technological divergence between China and the US/European Union (EU) during interviews, several companies noted that while they are hoping and planning for greater integration, they recognise that this may not be possible in the long run as tensions grow and export control toolkits expand. Some are already preparing for this potential outcome in certain technologies, especially in the digital realm, while others are closely monitoring the situation and keeping these risks in mind when planning corporate strategies.

While not included in the survey, most interviewed companies raised the challenge of talent mobility. In response to the COVID-19 pandemic, China has effectively closed its borders, with only a few international flights a week between major destinations, as well as strict, weeks-long centralised quarantine for the few that can enter. This has gutted the ability of companies to bring in researchers from their global operations, as well as for their local R&D experts to learn new skills/ideas abroad and bring back knowledge and know-how to China-based innovation work. The situation was reported by respondents to have significantly hampered innovation, in particular regarding further integration of China-based R&D with global activities, which is enhanced by face-to-face interactions, but also because of privacy/ security concerns of doing such work online. These border restrictions are further driving localisation of R&D—in this case personnel—which seriously holds back innovation that benefits tremendously from international collaboration among researchers with diverse backgrounds.

Two China R&D strategies emerge – 'all-in' and 'hedged bets'

Driven by both market and political forces, the companies in the business and economy classes report adopting variations on one of two general trends noted by the European Chamber: 'all-in', and 'hedged bets'.

The 'all-in' approach breaks down further into two distinct perspectives.

The first views China's R&D ecosystem as being so vibrant, companies are committing fully despite the threat of IP theft. Essentially, they see China as an innovation accelerator. They accept and manage associated risks in order derive the greatest benefit from China's entrepreneurial spirit, deep pool of gifted scientists and researchers, and the ability to commercialise innovations faster than anywhere else in the world. For many, this kind of R&D environment allows them to develop products in China that can then be rolled out globally.

The second tend to be in industries that are crucial but are not considered particularly 'high-tech', and often deal with niche technologies. An example would be a manufacturer of precision industrial equipment that is used for quite narrow purposes, the development of which entails incremental improvements to technology or processes. The perspective of these companies tends to be that, while they recognise the risks of undertaking R&D in China, they believe they will always be one or two steps ahead of the competition.

The companies that are 'hedging bets' recognise that it is important to develop products specifically for the China market but consider the risks of undertaking comprehensive R&D to be too great, with innovation of their core technologies only taking place in their safely-guarded home markets. Instead, they focus on localisation in China and seeking out complementary local technology to enhance their local and global product offerings.

A sub-set within these categories are SMEs. Even for those that have technology that is welcomed by China, and that recognise the benefits of the R&D environment, the risks are immeasurably higher. First, they do not have the same resources to devote to R&D and are therefore likely to be more dependent on government support. Second, they do not have the same resources to manage the risks of undertaking R&D. Third, compared to MNCs, SMEs may only manufacture and develop one or two crucial technologies, which raises the stakes exponentially – suffering IP theft would not only be extremely resource-intensive to counter, but it could also result in them losing their primary competitive advantage altogether.

The cargo hold: some European competitors hold on by their fingertips

Meanwhile, industries identified as being in the 'cargo hold'—those facing growing protectionism and state-directed preference for indigenous suppliers, such as in network equipment and services, and companies focussed on digital and telecommunications services—were almost completely absent from the survey and interviews.

Their lack of representation in the survey and subsequent interviews was not a coincidence and is in line with trends identified by the European Chamber in recent years. European companies in favoured sectors are increasingly turning to local providers to provide the kinds of goods and services that foreign firms in the cargo hold used to be leaders in, largely to suit Beijing's growing demands for localisation of such technologies. One member explicitly refused to participate on the grounds that if they were to report the specific challenges they are facing, it would draw unwanted government attention to their industry at a time when they are trying to solve some highly sensitive issues. Meanwhile, the sole ICT/telecommunications company that did complete the survey gave a generally worrying set of responses, most notably that:

- Their R&D intensity, the percentage of locally generated revenue that is reinvested into R&D activities, was reported to be in the category of 1.1–2.5%, well below the much higher rates normally found in that sector.
- They were the only respondent planning to cut R&D spending in 2022.
- They were one of the ten respondents noting that local firms have much easier access to government support schemes, and one of only four that found that this had a highly negative impact on their ability to compete with local firms.

This case runs contrary to what may be expected in other parts of the world. While China's prowess in the ICT/telecommunications sector makes competition harder, it should also mean that European players in that industry would want to contribute more resources to local R&D to tap into local talent and benefit from being part of the ecosystem. Companies do not stay away from Silicon Valley because they fear strong competitors; they go there to learn from them. Instead, the opposite is taking place in China.

Conclusion

It is important that the complete findings of this report be understood in a broader context. Companies, especially MNCs, in business and economy classes are likely to be as optimistic about the R&D ecosystem as they are about China's business environment in general. Meanwhile, those stuck in the cargo hold, or soon to be jettisoned mid-flight, are likely to be as pessimistic about the R&D ecosystem as they are about their overall prospects in a political economy that no longer wants them competing for market share against indigenous national champions.

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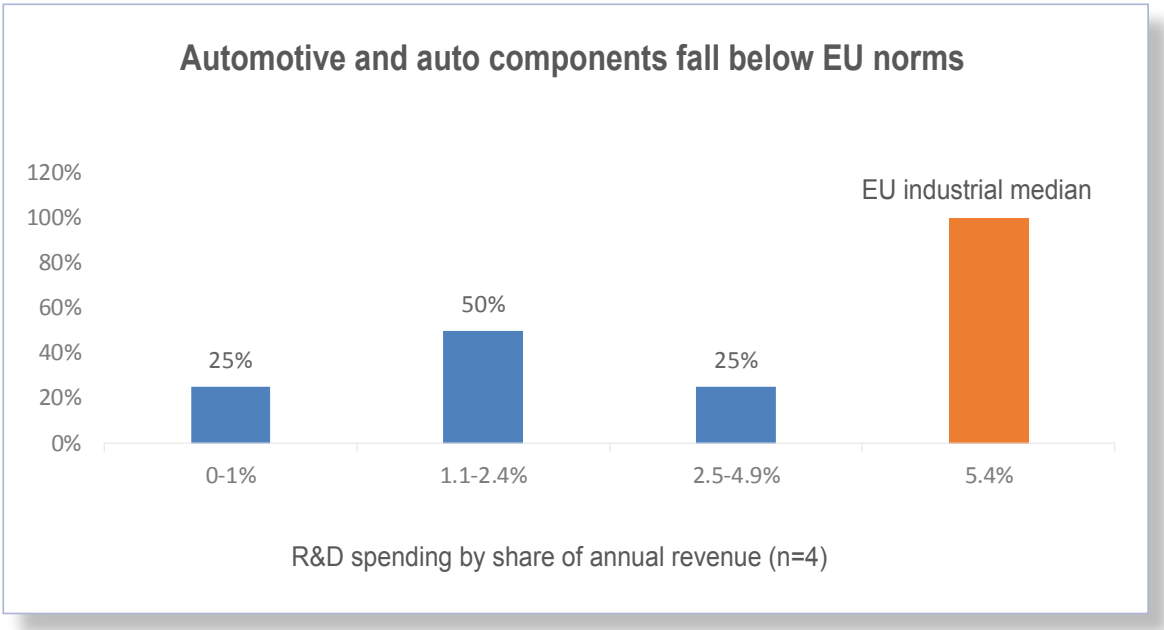
Recommendations and best practices for companies

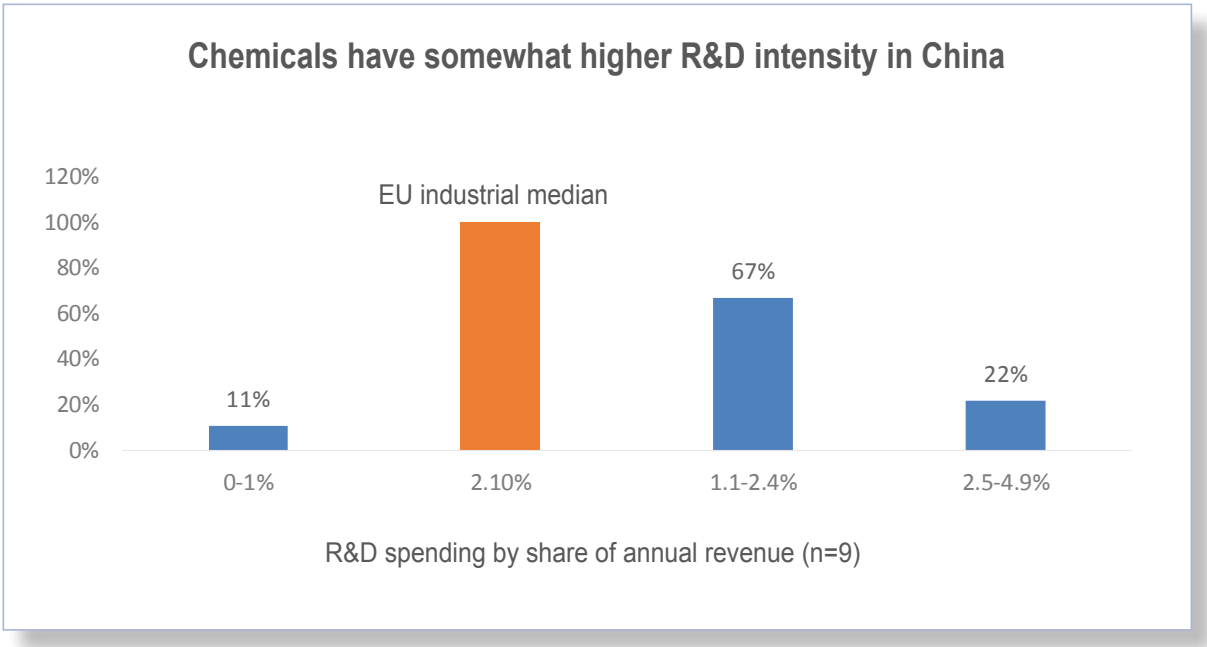
- China's R&D market is not for everyone, and careful strategic planning to map out where your company stands in the broader ecosystem (business, economy or cargo hold) is an important first step in determining if/how much your company should invest in China-based R&D activities.
- For those that see good reasons to engage in significant R&D work in China, determining whether to adopt either an 'all-in' or a 'hedged bets' strategy is also imperative.
  - In areas in which Chinese firms are at or nearing technological parity with your company, the 'all-in' approach may be necessary to be competitive.
  - In areas in which Chinese firms are still lagging, it may be more sensible to leave some of your most critical R&D work in your home market to mitigate leakage risks. One such interviewee even noted that despite the limited R&D they do in the Chinese market, they have a technology scouting team that identifies local researchers and innovative companies to partner with for their global offerings – effectively minimising technology flows *to* China and maximising technology flows *from* China.
- Protecting your IP is becoming more and more important, as in a growing number of industries it is no longer enough to stay one or two generations of technology ahead of local Chinese competitors that are themselves increasingly approaching the cutting edge.
  - Respondents noted that China's IPR protection system is increasingly mature for patent filing and enforcement.
  - However, it is lagging behind in trade secrets, especially in cases where researchers and engineers go to work for competitors in violation of non-compete clauses that are rarely enforced.
  - Companies should take note of which kind of IP their R&D results fall into, and recognise for which types they will be able to rely on judicial enforcement, and for which types they cannot.
  - SMEs should be especially judicious in protecting their IP. As the sole SME interviewee put it, "If an MNC suffers IP leakage with a partner on one product, it would only impact that specific part of their product portfolio. If an SME loses IP to a partner, it could well be our core competency and undercut one of the few products that we sell."
- While most respondents expressed disinterest in either joining state-backed innovation projects or seeking government support through research grants and subsidies, several interviewees elaborated on different strategies they employ to find and obtain support:
  - One company has a dedicated scouting team to seek government support, which they find to be highly productive and worth the investment.
  - Another has outsourced this task to a Chinese consultancy that has helped them find and obtain support most relevant for their company.
  - A third company has invested in building a strong network across industry and government to notify them when appropriate support schemes are inbound, which has also helped them to obtain support.
- Respondents generally downplayed the value of setting up R&D centres in China's high technology and innovation zones, largely on the grounds of limited interest due to the marginal benefits of locating there. However, this may be overlooking certain developments:
  - The number of these zones and the resources dedicated to them have drastically increased in recent years. Companies that lack interest in them may be operating under assumptions they formed about earlier zones, which may not apply to zones that have been developed more recently.
  - These zones are attracting a growing number of highly innovative Chinese companies of all sizes. Several interviewees reported that they have set up small R&D centres in relevant zones, not so much for the support schemes, but more to scout the local ecosystem and find collaboration partners.
  - Finally, while the support that China's special zones can provide may only be of marginal use to larger firms it may be far more valuable for European SMEs. At the same time, China has a growing number of innovation support schemes available outside of these zones, meaning locating to one may now be less necessary than in the past.

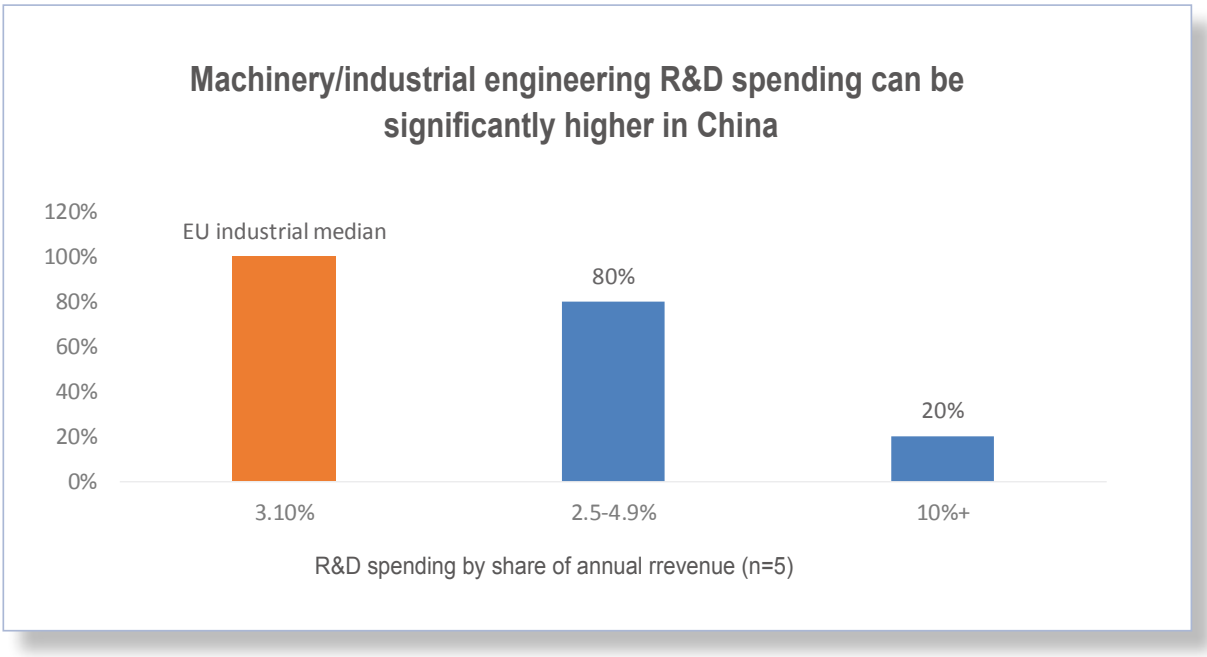
Detailed survey findings and interview content

R&D spending in the most represented industries (automotive and automotive components, chemicals, and machinery) indicate R&D intensity (investment as a share of annual revenue) levels are comparable to slightly higher than industrial medians reported in the EU in chemicals and machinery/industrial engineering, while automotive and automotive components were somewhat lower.[4]



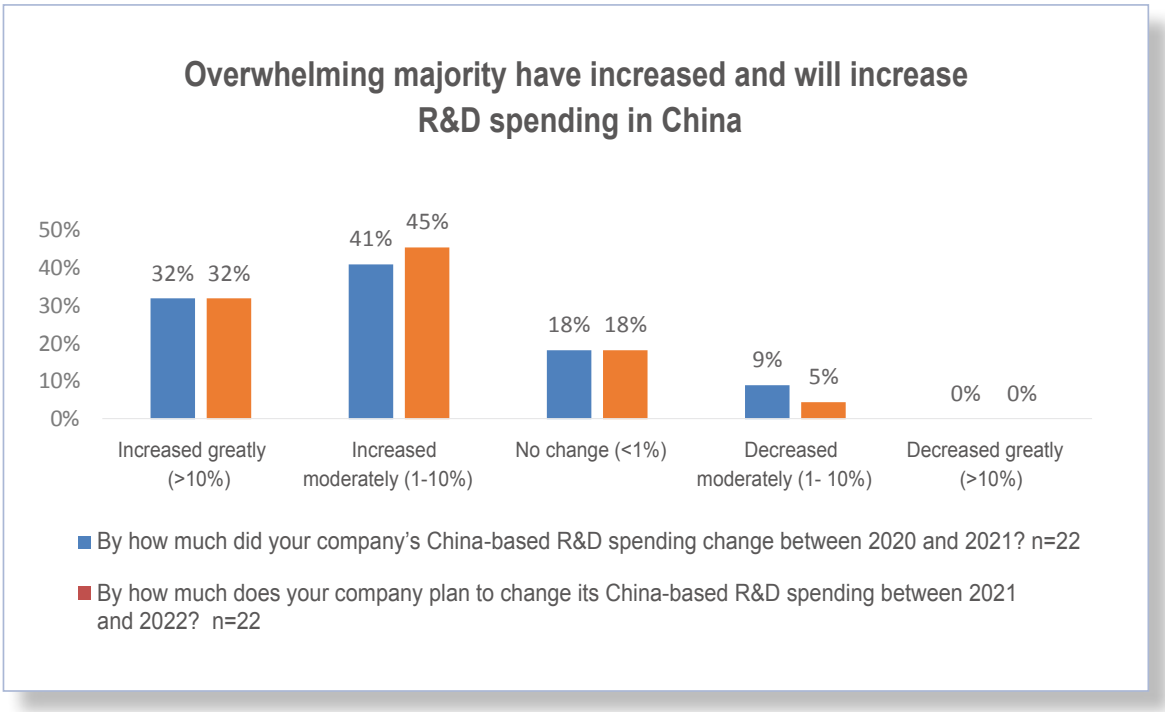
4 Medians were derived from: Grassano, N., Hernandez Guevara, H., Fako, P., Tübke, A., Amoroso, S., Georgakaki, A., Napolitano, L., Pasimeni, F., Rentocchini, F., Compaño, R., Fatica, S. and Panzica, R., *The 2020 EU Industrial R&D Investment Scoreboard, R&D ranking of top 1,000 EU+UK companies,* European Commission, 1st January, 2020, viewed 20th April 2022, <https://iri.jrc.ec.europa.eu/scoreboard/2020-eu-industrial-rd-investment-scoreboard>





The highest spending (more than 5% of annual China revenue) came from the aerospace and aviation, machinery, medical device and utilities industries. Meanwhile, two respondents, from the automotive and automotive components, and chemicals industries respectively, reported the lowest R&D spending (0–1%).

Interviewed companies overwhelmingly reported that their R&D spending in China has risen over the years as the importance of offering cutting-edge goods and services in the market has expanded. The fact that they are increasingly nearing the innovation spending levels of their global operations reflects this and suggests that China has become as important a place for companies to do R&D as other regions.



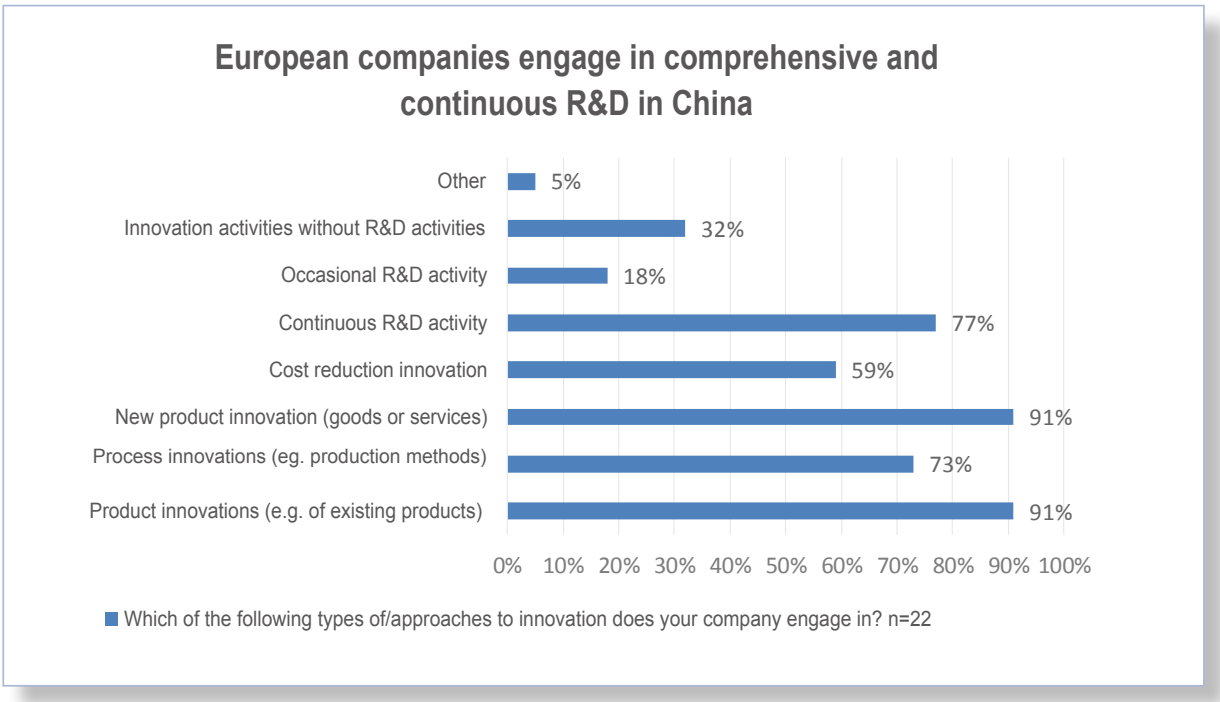
Nearly all respondents indicated that they increased their China-based R&D spending from 2020 to 2021, and that they intended to increase it even further in the next year. This was supported in interviews with companies that reported a growing need to increase their R&D footprint in China. Importantly, the recent and projected growth in European corporate innovation spending in China stands in contrast to the general decrease in R&D spending of companies in Europe. In 2020, Europe-based companies saw a 2.2% decrease in R&D spending due to the pandemic, in comparison to the average 18.1% increase for China-based companies, foreign and local alike. That shift is even starker in the most represented industries in the survey – chemicals, automotive and machinery.

This stands to reason from a portfolio perspective – during a crunch, companies will put their limited capital in the places where it will make the highest returns. As China was largely successful in maintaining its zero-COVID strategy at the time the survey was conducted (although not as successfully in the intervening months, which may impact the sentiment reflected in these results), it was a golden market for growth compared to the rest of the world, meaning investment—including in R&D—would be expected to increase. Furthermore, interviewed companies universally reported the need to further increase R&D activities in China to make the most of its innovation ecosystem and incorporate local developments into their global offerings.

The pandemic drove down corporate R&D spending in Europe, but did the opposite in China		
	EU average decreases in 2020[5]	China operations
Automotive and automotive components	-7.2%	100% increased budgets from 2020 to 2021 and 100% intend to increase budgets in 2022
Chemicals	-3.7%	71% increased budgets from 2020 to 2021 and 71% intend to increase budgets in 2022
Machinery/industrial engineering	-6.1%	66% increased budgets from 2020 to 2021 and 66% intend to increase budgets in 2022

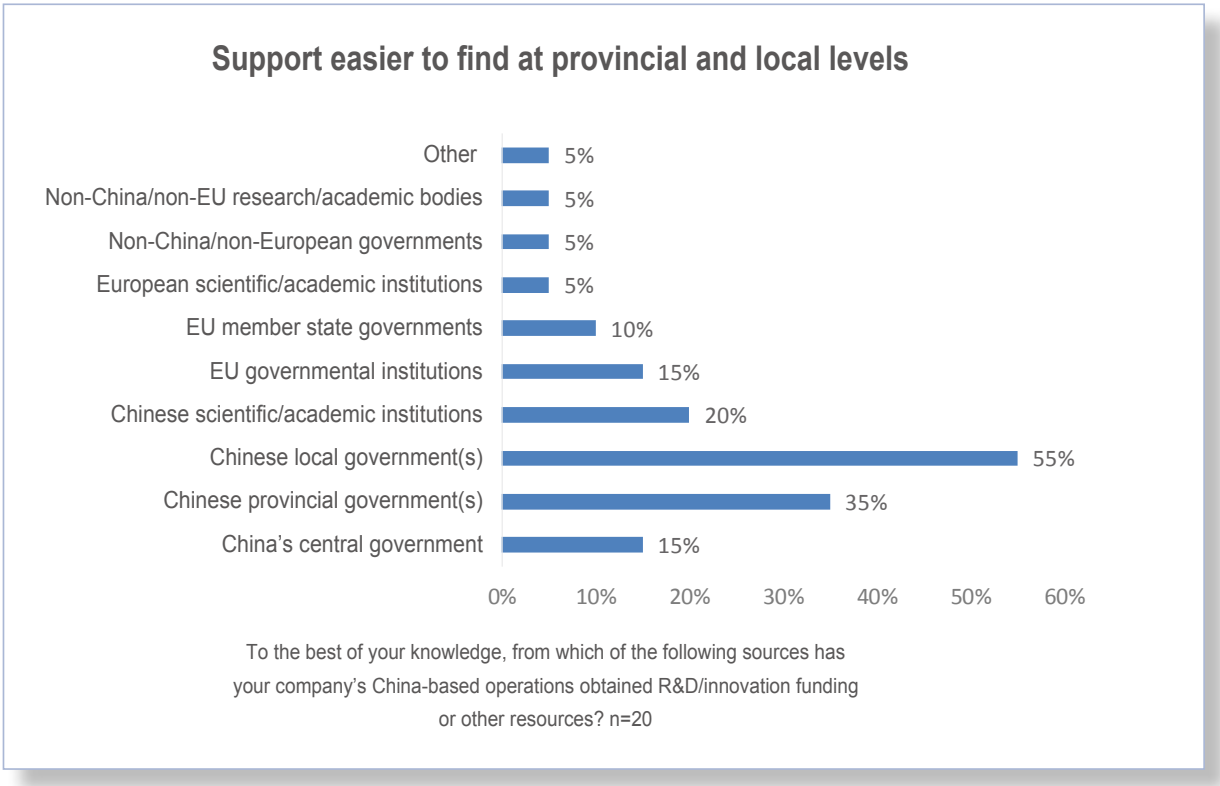
5 Grassano, N., et al, *The 2021 EU Industrial R&D Investment Scoreboard, EUR 30902 EN*, p. 6, European Commission, 2021, viewed 20th April 2022, <https://iri.jrc.ec.europa.eu/sites/default/files/contentype/scoreboard/2021-12/EU%20RD%20Scoreboard%202021%20FINAL%20online.pdf>

Three quarters of respondents indicated that they already utilise R&D in China to produce results used in both China and global markets. This represents a major shift from the focus on localisation of offerings developed at home that was the norm for foreign companies in China in previous decades. Interviewed companies almost universally noted this historical trend, with many now considering their China innovation work critical to their global innovation strategies. Importantly, when asked if they expected this to change in the future, respondents trended towards more innovation being done in China in support of their global offerings.



The maturity of China-based R&D activities was also indicated by the survey findings. The overwhelming majority of respondents report that they engage in continuous, as opposed to occasional, R&D activity. This includes: a) activities such as improvements to or localising their existing products; b) process innovations, like improving production methods and management systems; and c) new product innovation.

Product innovations are being pursued in a variety of ways by interviewed companies. Many companies reported the need for continued localisation of products developed overseas, especially to align with China's standards regime or to adapt a product for local tastes.

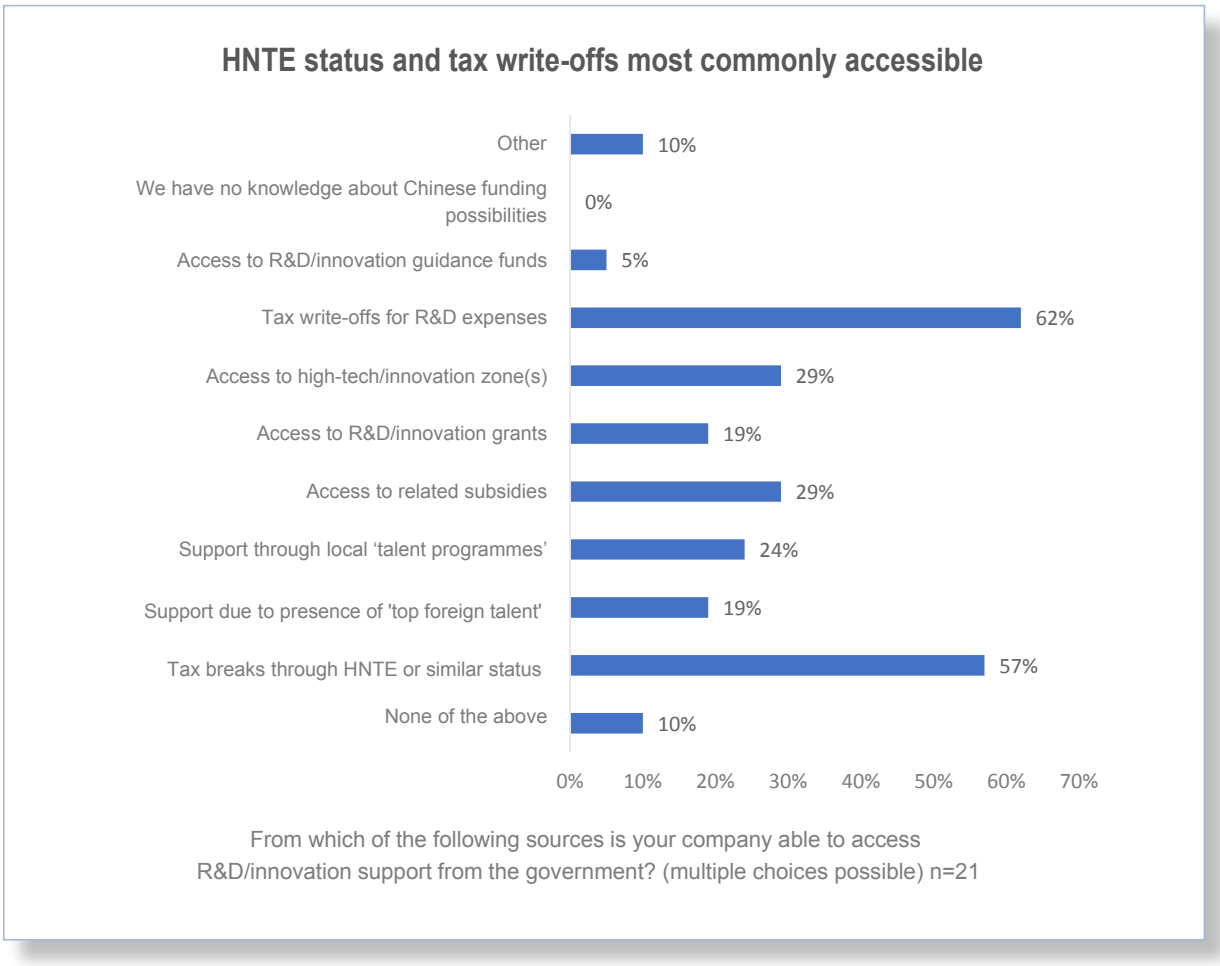


Surveyed companies noted that they had limited access to government innovation support schemes in China overall, with only a minority of respondents indicating that they received any resources from the government or academic / research institutions in the country. Nearly all interviewed MNCs reported that they either did not attempt to obtain government support at all, or that efforts to secure such resources were limited and ad hoc. Interviewees frequently stated that their companies did not see much value in seeking government support (for example, in subsidies, tax breaks or grants) due to the relatively small amount on offer or because the conditions attached to such support—including reporting requirements and benefit-sharing arrangements—were not acceptable.

However, a few interviewed companies had entered into such arrangements. When asked about the danger of IP leakage or similar risks, one interviewee remarked, "We know that whatever happens in these collaborations is likely to be shared with our competitor. But this has a limited impact on the value that we gain, and the pace of change in our industry is so fast that by the time our competitors have figured it out, we have already moved on to the next generation of technology." Another expressed similar sentiments, saying, "The best protection is to stay ahead of our competitors."

The sole SME that was interviewed had the opposite view, and reported that it was worth the effort to apply for grants and subsidies, even with certain onerous conditions attached, as such support could contribute meaningfully to their R&D spending.

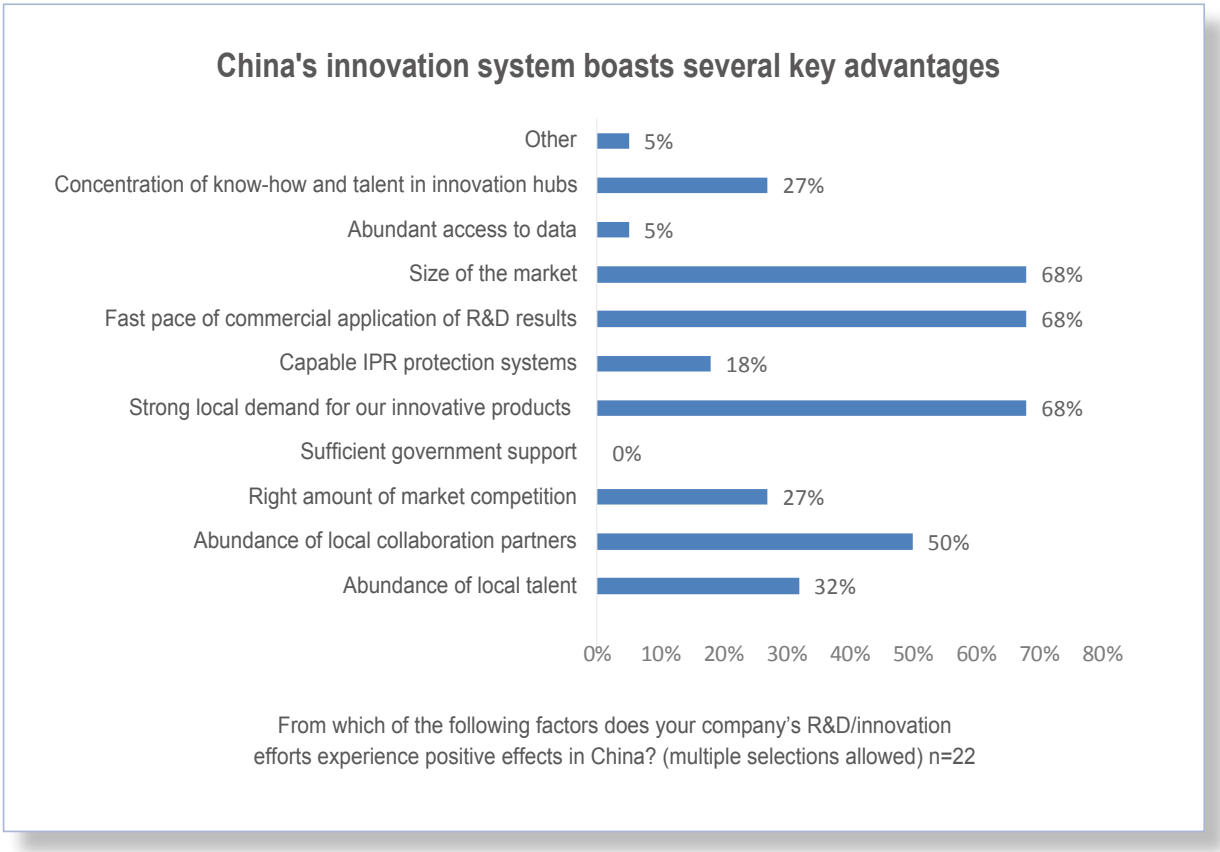
Those that had received government support were far more likely to obtain resources from local and provincial authorities than from national ones. Interviewed companies that had obtained government support noted that as they dealt more regularly with local officials than national ones, their closer relationship was a significant contributing factor to them gaining support locally. This tended to be in part because local officials would actively notify companies about new support schemes and in part because local officials tended to consider the presence of foreign companies in their locales to be of great importance and were therefore more welcoming to foreign companies applying for support.



Companies that had obtained government support were able to derive it from a variety of sources. Most common were the tax benefits for companies that obtained HNTE status, as well as tax write-offs for incurred R&D spending. The HNTE status requires annual review and reapplication every three years, and interviewees noted that it took considerable resources to apply for it. However, they universally noted that it was worth applying for as HNTE status benefits are valuable, the most significant of which is a 10-percentage-point reduction in taxes. Interviewed companies that had HNTE status noted that it was difficult to obtain and maintain that status in China's most developed cities like Beijing, Shanghai and Shenzhen, due to the higher expectations and presence of more technologically-advanced competitors. Meanwhile, companies with their main operations in less-developed regions obtained HNTE status relatively more easily.

Most interviewed companies reported that they were generally not interested in setting up operations in innovation and high-technology zones in China. This is largely because they prefer to have their R&D operations near to both their production sites and their customers and suppliers to make direct application of developments easier, and to keep R&D personnel close to producers so they can share ideas more easily. Another interviewee noted that this also reflects corporate culture to an extent – local companies have been conditioned to follow government guidance and pursue incentives, while foreign companies tend not to prioritise such things.

However, some respondents reported benefitting from accessing innovation and high-technology zones and engaging in R&D activities within them, chiefly due to the presence of both a strong local talent pool to draw from and competitors they could learn from. Others noted that while there is some value in these zones, it is often limited to the relative ease of finding partners for joint development in digitalisation and IT solutions. The SME reported that it had recently relocated to such a zone to benefit from support schemes that would meaningfully benefit its smaller operations. It also noted that by moving there, it had secured a 'privileged position'. When China suffered from chronic power shortages in mid- to late 2021, the high-technology zone it is in was often "the last industrial area to be 'turned off'".



A wide variety of factors contribute to positive views on China's innovation ecosystem. Interviews yielded insightful examples for many of these:

- Strong local demand/appetite for our innovative goods/services: One industrial equipment maker remarked that because China is its largest market for several products, they have almost fully localised production for those lines of business both for the China market and for export. As a result, much of the development and application side of its innovation activities for those products is done in China. Meanwhile, an interviewed chemical company noted that unique demands in China have driven them to develop new products. For example, the sheer amount of PM 2.5 pollution in previous years led them to develop new products to help reduce PM 2.5 emissions from

vehicles – something that would not have been developed in Europe.

- Fast pace of commercial application of R&D results: An interviewed head of technology scouting cited an example of attending a conference where they met a researcher that was demonstrating some promising findings for a piece of technology they were interested in developing. They ended up forming a partnership, with the individual going from carrying out basic research to becoming a tier-one supplier for their global offerings in the span of only a few years. Another executive at an energy company noted that the speed at which research moves on to commercial application is, “China’s biggest strength with regard to innovation”.

- China’s vibrant start-up culture also helps contribute to the speed of commercialisation of joint innovation. One interviewee struggled to find a solution to connect several components together according to local standards. They collaborated with a local start-up to develop a solution, which was delivered quickly. The two companies now share the final IP with an exclusivity contract at the cost of a lump sum payment and shared returns. Another company entered a partnership with a start-up to develop digital twin applications to train customers and suppliers. The interviewee noted that the partnership produced the applications “in a single month for half a million [Chinese yuan]”, whereas if they had done it themselves, “it would have taken half a year and cost half a million euro”.

- Size of the market: One head of research noted that the sheer size of China’s data market allowed for speedier breakthroughs in developing new technologies and refining current operations in China, and that the resulting applications are often then incorporated abroad. Another interviewee reported that the speed of innovation in the market alone would justify having R&D expertise in China, even if only to monitor new developments and scout the technology they will be competing with globally in due course.

- Abundance of local collaboration partners: China’s research bodies/universities/independent academics/state labs were partners for 71% of respondents. Interviewees often found highly entrepreneurial researchers/professors that were eager to find practical and commercial applications for their results, much to the benefit of the European companies that engaged with them.

Local private companies were also a partner for 57% of respondents, including China’s digital champions like Ant, Alibaba and Tencent. One interviewee that partnered with a local private partner noted that their company’s wide range of collaboration activities frequently involved “marrying European hardware with Chinese software”. They added that their local partners’ strengths in connectivity (specifically 5G and satellite communication) and quantum technology (especially in computing, sensors and communication) were of increasing importance to the European company’s global portfolio. Companies from China’s vibrant start-up scene were also common partners for interviewees, who frequently praised the sheer scale and speed of new players in the market. As one interviewee remarked, “For just about anything you want to look into, but especially in digital applications, you can find smart and eager young people in China to help make it happen.”

Several negative factors also exist in China's innovation ecosystem, with the most commonly reported—weak IPR protection—cited by a third of respondents.[6] Other examples of negative factors raised in interviews include the following:

- **Weak IPR protection systems:** Results from the European Chamber's annual *Business Confidence Survey* show that China's IPR system has steadily improved year-on-year since the survey began in 2004. This was also reflected in most interviews conducted for this study, with one exception. Interviewees from the chemicals and energy industries reported that China's enduring weakness in trade secret protection and enforcement continues to harm their businesses. This was especially true regarding non-compete clauses for engineers and researchers, who often go to work for state-owned competitors and take European know-how with them.

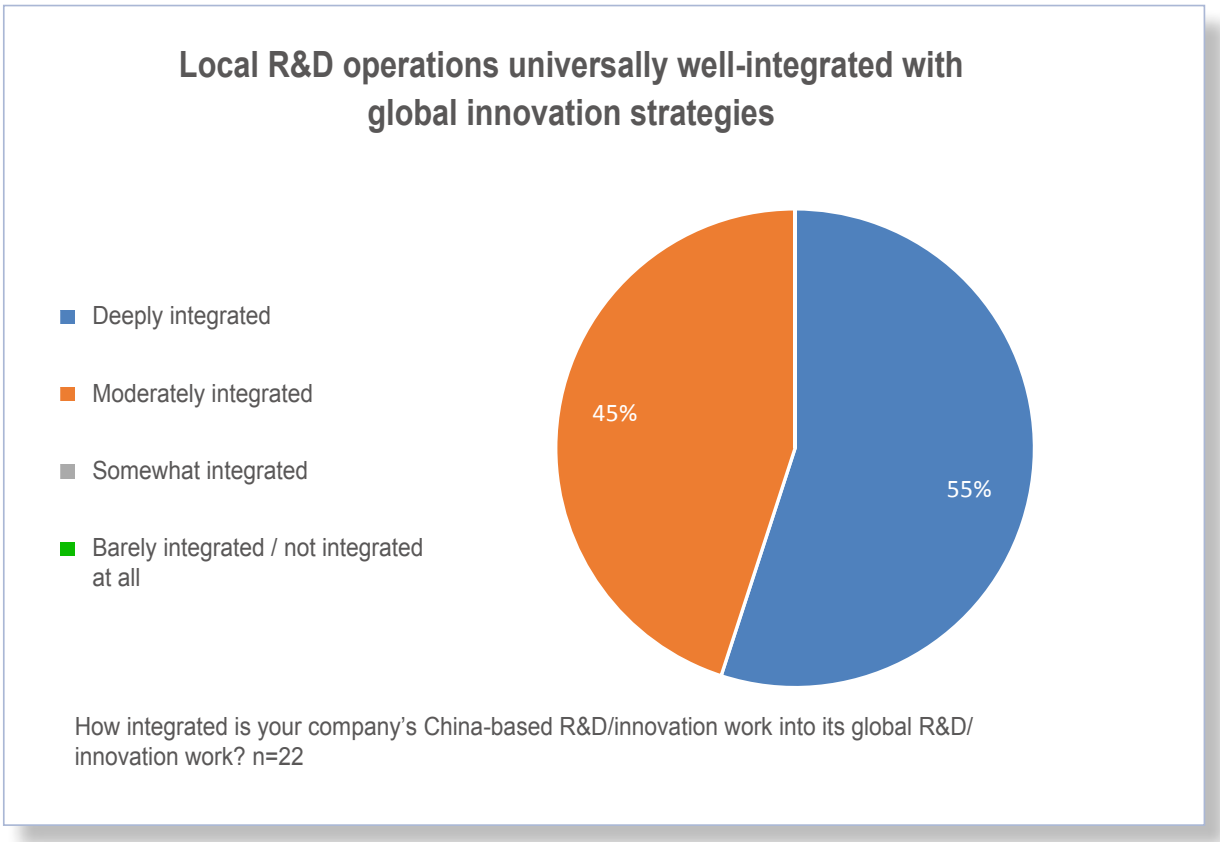
- **Unlevel playing field for foreign companies:** Multiple interviewees reported that they struggled to obtain HNTE status in China's most developed and innovative cities. As one executive put it, "They know we are in Shenzhen to make the most of the ecosystem here, so they don't need to keep us happy, and would rather tax cuts benefit local players." This contrasted with the experience of another company located in a medium-sized city that noted the local government was keen to keep them there with HNTE status since they directly employ so many locals and have also created jobs through their suppliers.

- **Insufficient local talent:** An industrial equipment-maker stated in an interview that their company struggles to find qualified young hardware engineers, as China's education system yields engineering graduates that have good theoretical knowledge, but little practical experience. The interviewee said it takes a year or two to get graduates to the basic level for reliable work, let alone to contribute to the company's innovation activities, after which many

6 This contrasts with the more positive aspects of China's R&D environment, with the most commonly reported positive factors—market size, fast pace of commercialising applications and local demand for innovation—being reported by two thirds of respondents. This generally more positive sentiment about China's R&D ecosystem was echoed throughout interviews.

move on to a local company. As they put it, "We often feel like we are training engineers for our competitors."

- **Negative sentiment in home market about R&D/innovation activities in China:** One interviewed technology officer reported that their company had benefitted significantly from EU-China Horizon research support. However, they worried that growing negative sentiment in Europe risks disrupting Horizon and other such government-to-government innovation partnerships moving forward.

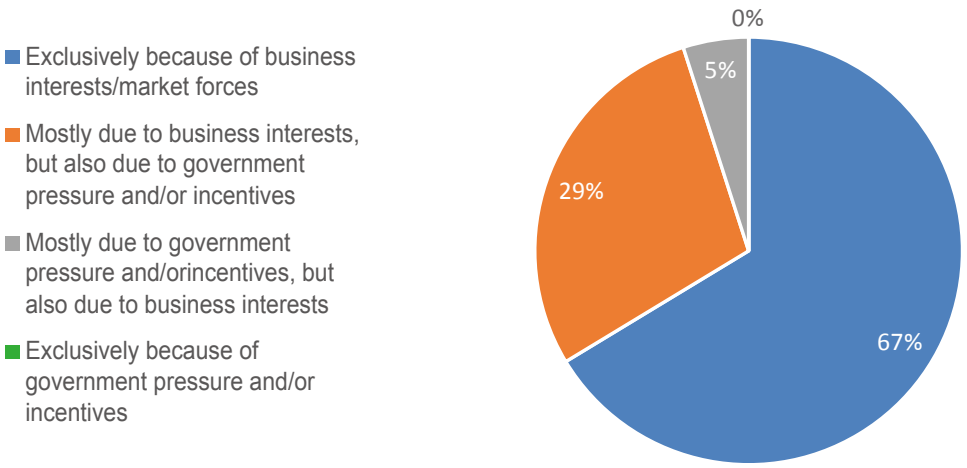


Respondents' China-based innovation activities are well-integrated into global strategies, with all reporting moderate (45%) or high (55%) levels of integration. Over the next five years, the level of integration is projected to increase for 64% of respondents and stay the same for 23%. The remaining respondents noted that they anticipate a slight decrease in integration. This is likely due to certain aspects of decoupling and technological divergence, which many interviewed companies reported as a concern. The perception is that as China pursues technological self-reliance, European companies in certain technologies will need to develop a more localised innovation strategy that suits Beijing's expectations. As the European Chamber has pointed out in previous reports, in some ways, certain European companies are exploring how to decouple their China operations from their global ones, which may in part explain why some respondents expect a decrease in integration.[7]

One industrial machinery company noted in an interview that their entire digital footprint in China is completely separated from their global one for exactly these reasons, and that in order to do so they had to enter into partnerships with local players to design digital systems to replace their global ones. They also anticipate that while their R&D spending is certain to increase in China, they will begin to refocus their R&D strategy back towards an 'in China, for China' approach.

7 *Decoupling: Severed Ties and Patchwork Globalisation*, European Union Chamber of Commerce in China and MERICS, 14th January 2021, viewed 19th April 2022, <https://www.europeanchamber.com.cn/en/publications-decoupling>; *European Business in China Business Confidence Survey 2021,* European Union Chamber of Commerce in China, 8th June 2021, viewed 19th April 2022, <https://www.europeanchamber.com.cn/en/publications-archive/917/Business_Confidence_Survey_2021>

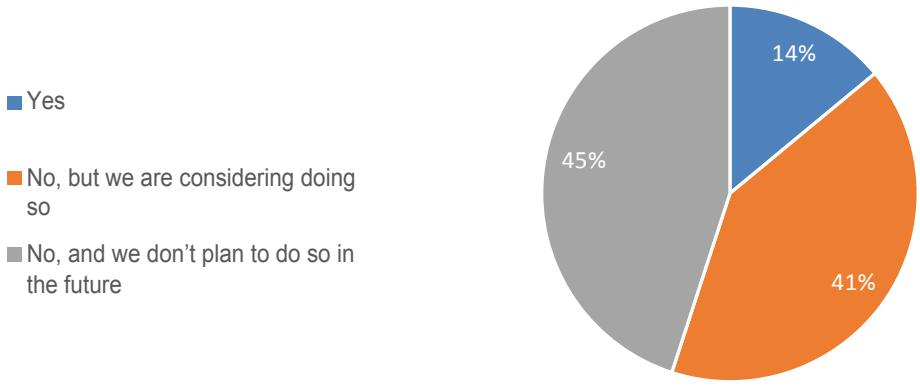
A third of respondents invested in R&D in China in part due to government pressure/incentives



Which of the following best describes your company's justification for engaging in R&D/ innovation activities in China? n=21

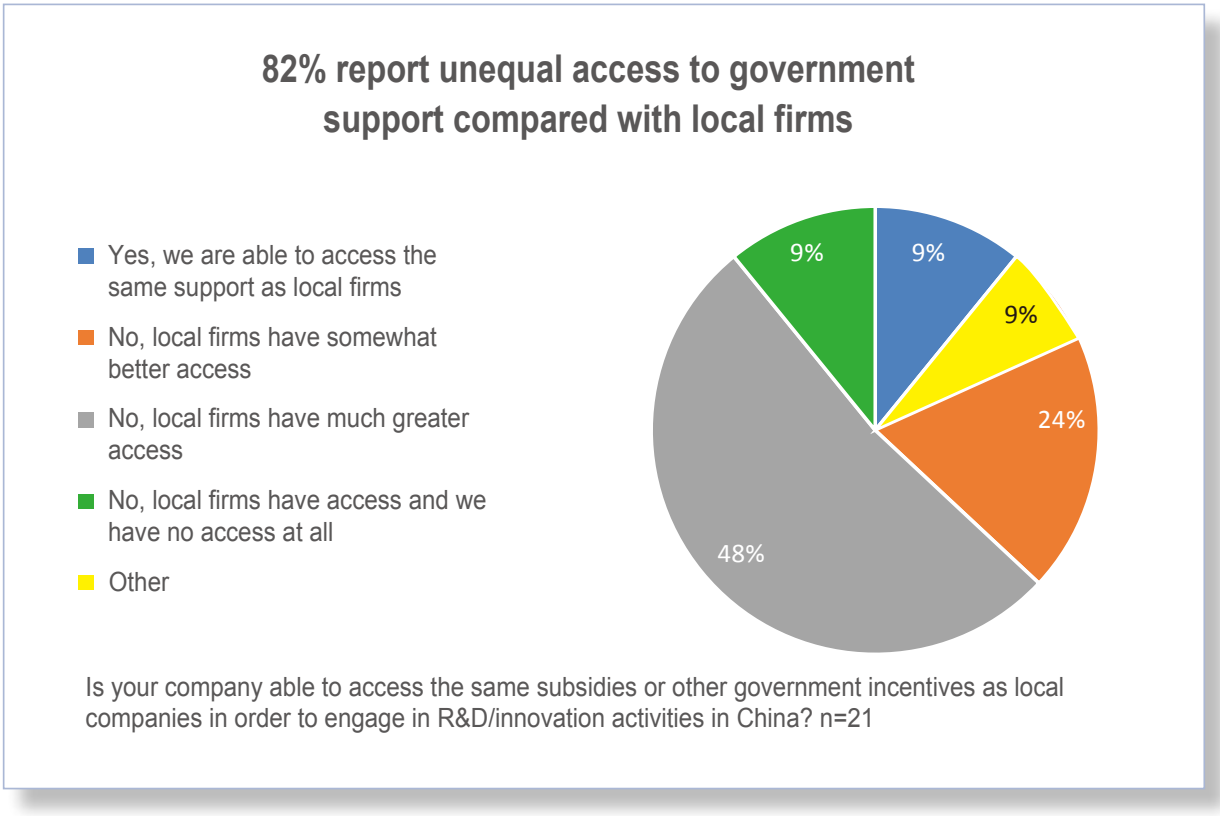
Respondents overwhelmingly engage in R&D and innovation activities in China exclusively or primarily due to market forces. This reflects what was gleaned during interviews and supported by the survey – China's innovation capacity is increasing, and companies are keen to tap into the resultant ecosystem to benefit their local and global operations. However respondents also indicated a 'carrot and stick' element, with a third reporting incentives and pressure from government contributed to their decision to invest in R&D. While incentives were welcomed, some interviewees noted negative pressure from the authorities to localise or face risks to their position in the long-term.

Small majority either have or are considering entering into a joint venture with a local firm to better access innovation support



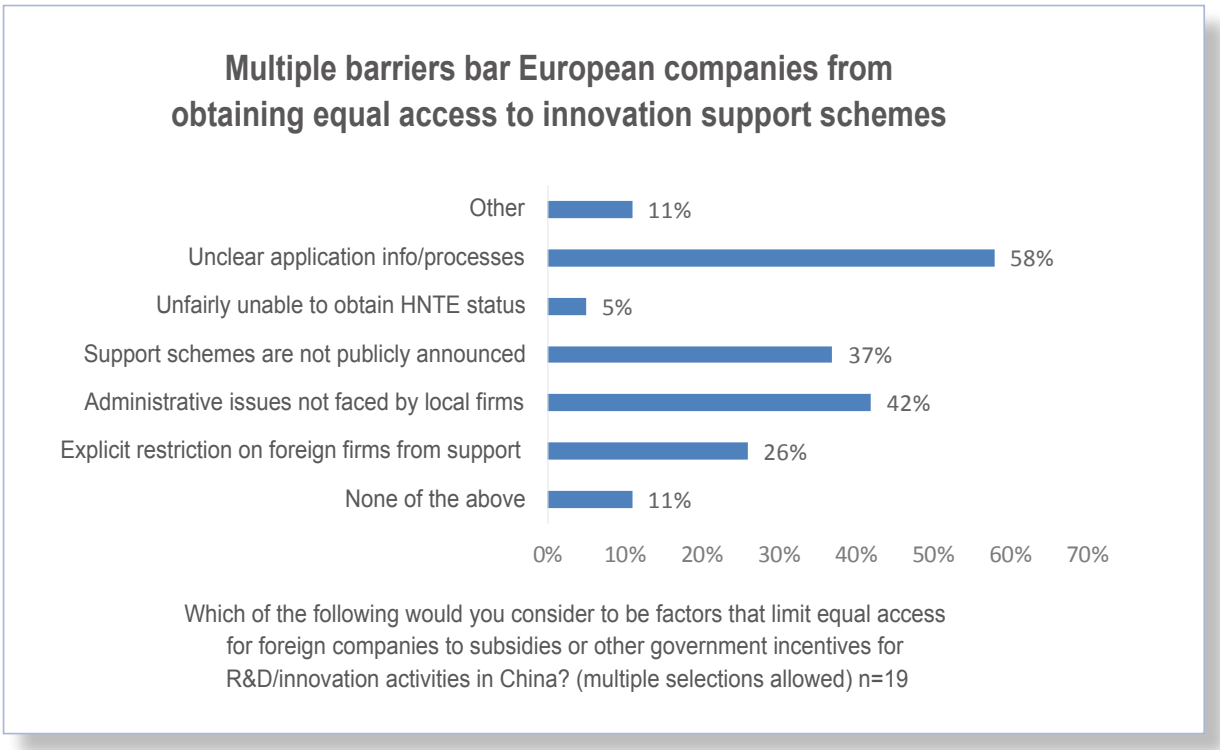
Has your company entered into any partnerships with local companies specifically to gain easier access to government R&D/innovation support? n=22

However, the nature of doing business and innovation work in China being mostly market-driven may be set to change. As the European Chamber found in its *Business Confidence Survey 2021*, 41% of companies reported that business had become more political in 2020, and a mere 4% expected business to become less political in the following 12 months. The politicisation of business likely impacts the finding from this survey that a small majority of respondents already have entered or are considering entering into partnerships with local companies in order to better access government innovation support. As government budgets continue to shift more resources towards China's self-reliance campaign, companies may be more incentivised to apply for such support. Under such conditions, it may not be enough to just conduct innovation work in China to qualify, it may also necessitate that a local company is a beneficiary of any R&D results.



Respondents also noted that entering local partnerships may make it easier to access government innovation support. This reflects the fact that most respondents report local companies as having easier access to such support. While 37% of those that viewed the playing field as unlevel in terms of access to support found the imbalance to be negligible, 42% viewed it as having a somewhat negative effect, and 21% saw it as having a highly negative effect. One interviewee argued that the size of grants and subsidies is growing, and that this makes pursuing support opportunities more interesting. They noted, however, that unequal access prevented them from benefitting from these larger support packages, whereas their competitors could, potentially putting them at a long-term disadvantage.

Unequal access to government-funded research projects is also a concern for some companies. As one industrial machinery interviewee put it, "We lose out on opportunities to contribute to and learn from big research projects on basic technologies, which presents a long-term risk."



Unequal access to government support manifests in a range of ways:

- Opaque or unclear application information/processes: Several interviewed companies stated that this was an issue when applying for HNTE status. They noted that the national-level guidelines for determining HNTE status were quite clear, but that information at the local level often deviates considerably, or that it is unclear or difficult to find. One industrial machinery company with innovation centres in multiple locations across China noted that differences between regions can be significant, leading to easy access in some areas and more difficult access in others.

- Explicit rules preventing foreign companies from accessing support: Interviewed energy and chemicals companies encountered certain projects, especially at the national level, in which foreign companies were barred from participating on national security grounds. They noted that while some were certainly legitimate security concerns, others were an overstretch of what normally constitutes 'national security'.

- Support schemes are not publicly announced, but are communicated only to local companies: Several interviewed companies reported that they are interested in applying for government support, but that support schemes are often announced with a very short timeline for submitting applications. Some stated that these timelines were often so brief that it would be impossible to prepare an application in time, which suggests that these kinds of grants are meant for local companies that are handpicked and informed of the application requirements ahead of time, with public notices acting only as an administrative formality. One interviewed company reported that they had actively built up a network of contacts in government and industry to increase their awareness of such opportunities, and that this had paid dividends as they were able to strategise accordingly. Another interviewee reported that they work with a local consultancy to help identify relevant grants and subsidies before they are announced, which has also helped them obtain support.

European Chamber
中国欧盟商会

About the European Union Chamber of Commerce in China

The European Union Chamber of Commerce in China (European Chamber) was founded in 2000 by 51 member companies that shared a goal of establishing a common voice for the various business sectors of the EU and European businesses operating in China. It is a member-driven, non-profit, fee-based organisation with a core structure of 34 working groups and fora representing European business in China.

The European Chamber now has more than 1,800 member companies in seven chapters operating in nine cities: Beijing, Nanjing, Shanghai, Shenyang, South China (Guangzhou and Shenzhen), Southwest China (Chengdu and Chongqing) and Tianjin. Each chapter is managed at the local level by local boards reporting directly to the Executive Committee.

The European Chamber is recognised by the European Commission and the Chinese authorities as the official voice of European business in China. It is also recognised as a foreign chamber of commerce by the Ministry of Civil Affairs. The European Chamber is part of the growing network of European Business Organisations, which connects European business associations and chambers of commerce from 42 non-EU countries around the world.

Principles:

- We are an independent, non-profit organisation governed by our members.
- We work for the benefit of European business as a whole.
- We operate as a single, networked organisation across Mainland China.
- We maintain close, constructive relations with the Chinese and European authorities, while retaining our independence.
- We seek the broadest possible representation of European business in China within our membership: small, medium and large enterprises from all business sectors and EU Member States throughout China.
- We operate in accordance with Chinese laws and regulations.
- We treat all of our members, business partners and employees with fairness and integrity.

About the Mercator Institute of China Studies

The Mercator Institute for China Studies (MERICS) was founded in 2013 by Stiftung Mercator to strengthen knowledge and debate about China in Germany and Europe. With about 20 full-time international researchers, from Europe, the United States, Australia and Singapore, MERICS is currently the largest European research institute focusing solely on the analysis of contemporary China and its relations with Europe and the wider world. Our specialists have a wide range of expertise on China, scientific qualifications and methodological skills. With its main premises in Berlin, MERICS also operates an office in Brussels.

The institute provides a collaborative platform for cutting-edge research on China by cooperating with numerous national and international research institutions. The MERICS Fellowship Program allows leading specialists, policy advisors and journalists from Europe, China and elsewhere to contribute to and draw on MERICS's research and outreach activities. The MERICS European China Talent Program brings young professionals together to enrich and expand Europe's perspective on modern China.

Our mission

Since its foundation, MERICS has established itself as the go-to European think tank on China. The institute has set itself a goal of contributing to a differentiated understanding of China by developing nuanced and better-informed perspectives on the country and its global impact. MERICS prides itself on fact-based, and independent research.

MERICS plays an active role in informing European public debates on China and in providing senior decision-makers across Europe with in-depth China-related insights critical to their portfolios. MERICS publications often drive China policy debates and are frequently quoted in European and international media. Independent research means that MERICS experts will take a stand — one firmly grounded in liberal-minded and democratic values. In doing so, MERICS experts provide new perspectives on China and advice for shaping relations with it.

As a leading China research institute, we recognise the plurality of voices and views in and on China. We embrace our responsibility to critically reflect on the role of stereotypes, biases and simplifications in China research as well as the ways in which our work impacts wider societal perceptions of China and the Chinese people.

China's Innovation Ecosystem:
Right for many, but not for all

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