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European Union Chamber of Commerce in China 中 国 欧 盟 商 会



# CHINA'S INNOVATION ECOSYSTEM THE LOCALISATION DILEMMA

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### **European Union Chamber of Commerce in China**

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### Foreword

As shown in our joint report *China's Innovation Ecosystem: Right for many, but not for all*, published in June 2022, many European companies saw enormous value in doing research and development (R&D) in China for a number of reasons. The size of the market, the variety of available collaboration partners and the fast pace of commercialisation of R&D results drove some European companies to increasingly integrate China R&D with their global efforts. However, the risks of engaging in R&D in China, such as inadequate intellectual property rights (IPR) protection systems, an unlevel playing field for foreign companies and negative sentiment in their home markets towards R&D in China, acted as a deterrent to others. The 2022 report also revealed that the benefits of engaging in R&D in China were not universal: the related risks and challenges were found to be disproportionately larger for small and medium-sized enterprises and those operating in industries in which investment is not encouraged in China, such as information and communication technology.

Our second joint report looks at the wide spectrum of R&D strategies European companies are deploying in China to mitigate risks and maximise their competitiveness. It comes at a time when optimism about business prospects in China is starting to reappear following the country's abandonment of its zero-COVID policy, and as face-to-face exchanges at all levels between Europe and China are gradually resuming. However, it also comes in the context of steady escalation of the United States-China struggle for technological supremacy, all while geopolitical factors—such as the war in Ukraine—are making the situation more complex. Companies across the board are now placing far greater importance on risk assessments when deciding their future R&D plans. It is therefore especially important for both businesses and policymakers to understand the role European companies play in China's innovation ecosystem, as well as the positive effects and potential liabilities of doing so.

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 as well as MERICS' researchers, Jeroen Groenewegen-Lau, head of programme for the Science, Technology and Innovation Policy Team, and Jacob Gunter, senior analyst with the Economic Research Team. We also thank Alessio Petino, a consultant on European Union-China research and innovation relations, for his independent, on-the-ground research that contributed to this report. Finally, a note of appreciation for the support and feedback of other partners under this BMBF project consortium: Prof. Dr Jörn-Carsten Gottwald, professor of 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.

Jörg Wuttke President European Union Chamber of Commerce in China

Aukko Hustan

Mikko Huotari Executive Director Mercator Institute of China Studies (MERICS)

# **Executive Summary**

Members of the European Union Chamber of Commerce in China (European Chamber) have provided unique insights into China's innovation ecosystem for this report. A late 2022 survey of 107 European companies backed up by extensive follow-up interviews—portrays a complex environment that necessitates a wide range of localisation strategies to be deployed depending on the industry each company is in and the contribution they can make to China's strategic goals, as well as their size. Periodic adjustments to these strategies are also required in order to both better align with China's increasing innovation capacity and manage emerging political factors that are undermining long-term business confidence.

There are several positive market factors steering a large share of European companies towards deeper localisation, including the size of the Chinese market (61%), strong demand (47%) and the fast pace of commercialisation of research and development (R&D) results (39%). These factors have created an extremely dynamic environment that incentivises onshoring of R&D operations in order for companies to be closer to their customers so they can tailor innovation to their needs more effectively and, in some cases, even export R&D results to the rest of the world.

At the same time, a number of regulatory factors are having both a positive and negative influence on R&D strategies, with some incentivising companies to localise and others forcing companies to put strict limitations on their R&D operations. Policy-related factors reported as having had a negative influence on R&D strategies include China's weak intellectual property rights (IPR) protection system (34%), an unlevel playing field for foreign companies (32%) and limited or non-existent government support (24%). However, of those that could access R&D-related government support, policies reported as having had a positive impact include tax incentives (46%), access to related subsidies (35%), and those related to attainment of high- and new-technology enterprise (HNTE) status (32%).

Further complicating the picture is the Chinese Government's ongoing advancement of its technological self-reliance campaign, aimed at creating completely localised supply chains insulated from external shocks, while expanding the country's access to foreign technology. This is resulting in increased pressure for certain companies to localise technology and onshore R&D into China. While demands to do so are coming primarily from state-owned enterprise (SOE) and government customers, private business partners are increasingly exerting their own influence.

One of the core requirements for investing in R&D is a predictable and reliable business environment. While business confidence was deeply eroded by China's stringent zero-COVID policy and the subsequent lockdowns and travel restrictions, many European companies are optimistic and expect this to be restored over time. However, the impact that geopolitics is having on the stability of China's business environment is only expected to worsen. Nearly half of respondents reported negative impacts on R&D strategies resulting from Russia's invasion of Ukraine, and many interviewees said the role that corporate risk assessments are now playing in strategy-making is unprecedented. A potential escalation of Russia's war in Ukraine or further frictions in the Taiwan Strait are scenarios that businesses are taking into account, and the potential risks they pose do not support a case for increasing R&D investments in China.

These factors, among others, pose a dilemma for European companies. The rewards of localising technology and R&D into China are considerable, but so are the potential hazards. The broad spectrum of strategies being employed by European companies are bookended by two opposing views: as one company noted, it is essential to do R&D in the China market to make the most of the innovation ecosystem and compete for market share with domestic rivals; another posed that since China's system favours local competitors and because technology leakage risks are high, it makes more sense to secure and increase their share in other markets outside China; their logic being that there they only have to compete with their Chinese counterparts, and not the Chinese Government as well.



# Background

To better understand China's innovation ecosystem, European companies' priorities, and the related opportunities and challenges, the European Union Chamber of Commerce in China (European Chamber) and the Mercator Institute of China Studies (MERICS) conducted a survey of European Chamber members, receiving 107 responses. To provide a more complete picture, 11 interviews were conducted with Chamber members and additional field research carried out. The overall findings offer a sample of the current ecosystem and an in-depth look at how some companies interact with it.

This report is the second of a planned three rounds of surveys and interviews, which fall under a consortium project supported and funded by the German Ministry of Education and Research. It is a result of collaboration between the European Chamber and MERICS, with input from partners at Ruhr University Bochum and the University of Duisburg-Essen.

The survey was launched on 22<sup>nd</sup> November 2022, with nearly all responses gathered prior to the removal of COVID restrictions across China on 7<sup>th</sup> December, with only two responses being logged after that date. As such, the survey data does not capture any potential shifts in trends that may have resulted from that change. However, the core interviews for this report were conducted in January and February 2023, meaning that some changes in sentiment related to the pandemic restrictions being rescinded are reflected in the final report.

# The Localisation Dilemma

For European companies in China, localising operations is a strategic decision – particularly so with regard to R&D/ innovation activities. Many European companies, especially multinational companies (MNCs), have already heavily localised their technology for production, which tends to be more focussed on the later stages of the development side of innovation. However, the pull of market factors—like China's flourishing R&D ecosystem and strong consumer base—as well as the push of policy and political factors—like the government's localisation demands and broader geopolitical tensions—are compelling European companies to further rethink their technology and R&D strategies. To put it simply, integrating into China's innovation ecosystem is an increasingly high-risk, high-reward strategy. This has created a dilemma that was best summed up by one member company interviewed for this report:

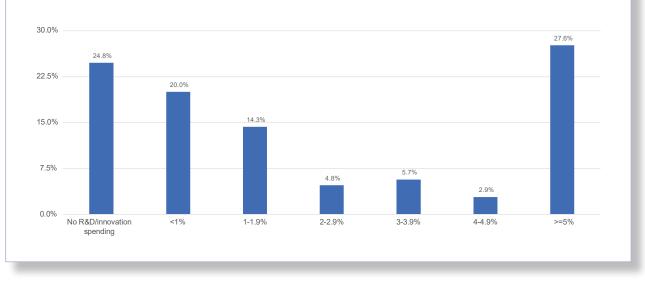
"Are we going to help our competitors if we come to China with our technology, or are we going to help ourselves? This is the great question for foreign companies looking at China."

A range of localisation strategies exist for European companies in China, bookended by two extremes illustrated by two interviewees with radically different outlooks:

"You can stay in your bunker in Europe and wait for Chinese competitors that benefit from their local innovation ecosystem to come to your door, or you can do as our company has and fight the battle in China and compete."

"You can bring your technology to China to try to compete with local counterparts who will have politics on their side and who might take your technology, or you can focus on building market share in other markets and crowd out Chinese competitors before they get there – we have taken the latter option."

This dilemma was captured in the survey data, with 45% of respondents adopting the most conservative strategies of either spending nothing or less than 1% of annual China revenue on local R&D. Meanwhile, 28% adopted a more assertive strategy, spending over 5% of annual revenue on local R&D.



# Chart 1: To the best of your knowledge, as a share of your company's China-based revenue, how much did your company spend on China-based R&D and innovation in 2022?<sup>1)</sup>

1) Including locally generated funds and funds transferred from headquarters (HQ) and other sources abroad

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### R&D localisation strategies are varied, but can be benchmarked based on several key factors

The push-pull dynamic of political and market factors has resulted in European companies employing diverse strategies, with several choosing to onshore R&D operations and certain technologies into China. While the nuances of individual corporate strategies vary, survey participants and interviewees can be broadly organised into the following categories:



Integrators - companies that are heavily involved in China's innovation ecosystem

Integrators do extensive R&D in China for both the domestic and global markets. They form close partnerships with a range of actors in China (local firms, foreign firms, universities/research laboratories) and collaborate on a variety of issues, including human resources (HR) cultivation, core innovation and complementary innovation. They believe that an open approach to innovation is their best strategy, both in China and globally, because they can 'run faster' than the competition and claim market share to suppress their competitors' growth potential. Examples: materials, chemicals, industrial inputs and machinery.

# Market-chasers – companies that recognise China as the key global market for certain technologies, and that this is where 'real innovation' is taking place

This group of companies believes that they must be an R&D player in China, not only to win local market share but also to stay globally competitive. It includes original equipment manufacturers (OEMs) of a given technology (for example, magnetic resonance imaging (MRI) machines), or for companies that are suppliers for that technology (like a supplier of magnets that go into MRI machines). This group may also engage in a wide range of collaborative partnerships, but core research conducted jointly tends to be limited to the technologies for which China is the main market, while core research of other technologies takes place in home markets. Examples: pharmaceuticals and their suppliers, battery and electric vehicle (EV) producers and their suppliers, suppliers of wind turbine manufacturers and suppliers of photovoltaic cells (PVC) manufacturers.



Withholders - companies with a very limited R&D footprint in China due to technology leakage concerns

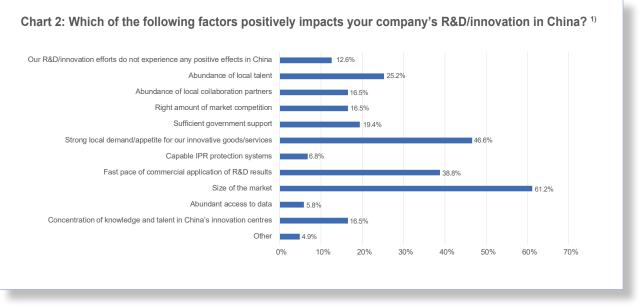
They focus on 'D', with their R&D operations in China primarily for localising products that are developed in their home market. They tend to do very little, if any, R&D collaboration in China. If they do, it is overwhelmingly in the area of complementary innovation. The adoption of this strategy also seems closely linked to corporate culture, as family-owned German *Mittelstand* companies—or small and medium-sized enterprises (SMEs) occupying niches in global value chains—often fit this grouping. Withholders that are more technologically advanced than the competition also tend to limit localisation because they feel they can resist the Chinese Government's demands as Chinese customers need their product or products too much. Examples: aerospace components, industrial machinery, chemicals and medical devices. Meanwhile, withholders that see little to no technology gap with their competitors may feel that R&D resources are better spent in other markets. Examples: industrial inputs and machinery.

### Niche cultivators - companies with too few technologies to risk leakage, so keep R&D at home

Overwhelmingly composed of European SMEs, niche cultivators' level of R&D localisation in China is extremely limited due to technology leakage concerns. This poses a particular risk to these companies as they generally have fewer product lines, meaning the loss of any technology to a competitor could put a large share, if not the entirety, of their business in jeopardy. Collaboration is similarly very limited or is not considered at all, with more than twice as many SME respondents than MNC respondents noting that they do R&D exclusively in-house. By their nature, SMEs occupy niches across a wide range of industries and are often global leaders with a considerable technology gap between them and their Chinese competitors – a gap they feel they can maintain by conducting R&D exclusively from their home market headquarters (HQ).

### Market factors push firms to localise R&D and chase the growing opportunities in the market

When asked to identify from a list of options which factors in China had a positive impact on their company's R&D activities, the three most selected were market-orientated: the size of the market (61%); strong local demand/appetite



1} Multiple selections possible



for respondents' innovative goods/services (47%); and the fast pace of commercial application of R&D results (39%). One of the most significant driving factors for localisation of R&D and technology in China is that the country presents either an important market or is the market globally speaking. This was true both for companies upstream in a value chain, as well as those at the OEM level. As one interviewee put it, "Where China is strong in industry, it will become strong in R&D. That's just how it happens." This motivating factor for R&D localisation came up repeatedly in interviews:

- Photovoltaic cells (PVC): European suppliers of inputs for the wind turbine and PVC (solar panels) sectors see the Chinese market potential for long-term maintenance sales as being so vast that they prioritise R&D in the market to serve the needs of customers they expect to grow into giants in the future. This is likely to become even more relevant with China's emerging debate on draft export controls on certain PV-making technologies – making China the only place that companies can integrate into the value chain.
- Electric vehicles (EVs): OEMs in the EV industry are keen to compete directly with their Chinese counterparts, not only to fight for local market share, but also to tap into an already world-leading innovation ecosystem for their sector.
- **EV suppliers:** Similarly, suppliers to the EV sector, such as in new materials and battery technology, recognise the size of China's EV market and want to lock themselves in as key parts of the value chain, which necessitates strong R&D activities on the ground for collaboration.
- **Hydrogen:** Several companies exploring the hydrogen value chain also expressed keen interest in doing R&D in China due to the amount of government support and corporate activity in that technology. They plan to use China as part of a global R&D ecosystem focussed on hydrogen technology so that they can stay on the cutting edge.<sup>1</sup>
- **Digital:** Finally, interviewees consistently pointed to examples of collaboration with China's innovative digital players both the established digital champions like Alibaba and Tencent as well as startups. However, this tended to be R&D collaboration that complemented any given portfolio, rather than as part of their core technologies (see page 14 for more details).

Some European companies are motivated to localise certain R&D in China due to unique traits of the market. One pharmaceutical company noted that China's healthcare system in its biggest cities is a unique draw – such cities will often have entire hospitals dedicated to specific ailments, which makes clinical trials far easier to conduct. Another pharmaceutical company reported that the relatively higher or lower rates of certain health complications influenced whether it did R&D in China. For example, the absence of nut allergies means they do no related research in China, while they do carry out R&D of lung cancer and oesophageal cancer due the higher-than-average rates of those diseases among the Chinese population.

At the same time, market dynamics can also prevent some companies from onshoring R&D into China. One MNC argued that the space for its specific technologies in the EV industry is oversaturated, and that the return on investment for focussing on the local market is actually much lower than in other parts of the world. When those considerations are added to the risk of technology leakage to their competitors, the company explained it made most sense to direct its R&D focus to other markets.

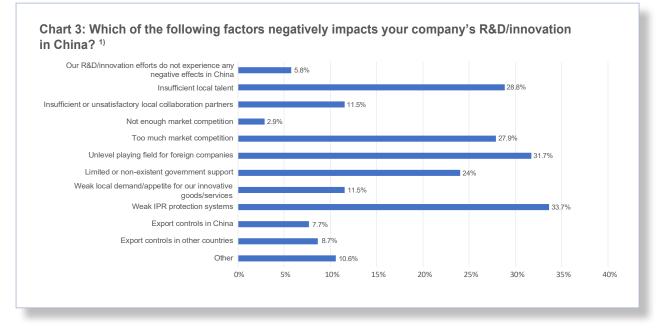
Costs are also an issue for several interviewees. One company noted the payroll costs for R&D personnel in Shanghai are now the same as in their home market, while another said that the extreme competition for talent in certain technologies has driven up R&D salaries so high that the company struggles to cover them.

<sup>1</sup> The abundance of examples of R&D aligned with China's strengths in the green technology ecosystem reflects China's position in many of those technologies. However, it may also reflect that technologies related to the green transition are far less likely to draw political scrutiny within China and in home markets.



### Political factors also drive localisation, mostly in unwelcome ways

Companies also reported that policy and politics are increasingly influencing their strategies for localising R&D and technology in China, so much so that one interviewee admitted that their China team now does a comprehensive risk assessment twice a year instead of once every two years as was the norm in the recent past. When survey respondents were asked to identify negative factors influencing the China R&D ecosystem, of the five most selected factors, three were politics- or policy-related: weak IPR protection systems (34%); unlevel playing field for foreign companies (32%); and limited or non-existent government support (24%). The remaining two were insufficient local talent (29%) and too much market competition (28%).



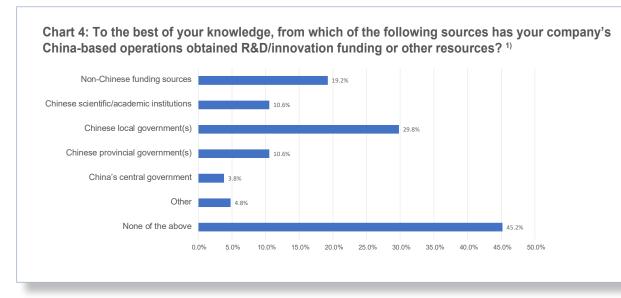
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### Support measures can make a big difference, if European companies can access them

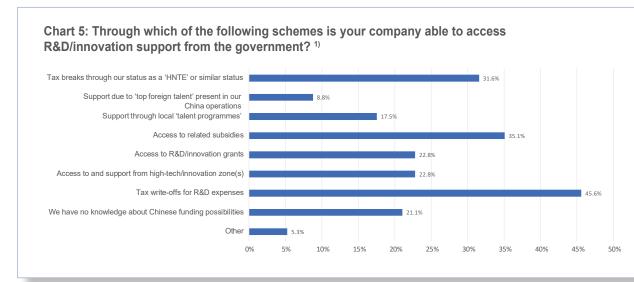
China's cyber and data security legislation and its supporting regulations and broader self-reliance trends (like the push for autonomous and controllable technology adoption) have created a complex ecosystem that brings varying degrees of pressure on a number of European companies to localise their cyber and data systems, either due to explicit sectoral localization requirements, or to the increased operational burdens and uncertainties created by existing compliance obligations. The minority of firms that are most affected by these often-overlapping rulesets have experienced knock-on effects on their R&D operations. One interviewee said the value of big data analysis at the global level has been all but lost because of this, while another noted their China system is so different than their global one that it seriously impacts communication and collaboration.

Government support aimed at encouraging higher R&D spending in China is extensive at both the central and provincial level. This applies to foreign investors as well, who report that such measures are incentives for them to bring certain R&D into China, as well as to register intellectual property (IP) in the country. Survey respondents report that it was more common to find support at the local level (30%) than at the provincial (11%) or central (4%) levels. This support was most reported as delivered through tax write-offs for R&D expenses (46%), access to related subsidies (35%), and through attaining high and new technology enterprise (HNTE) status (32%).





#### 1} Multiple selections possible

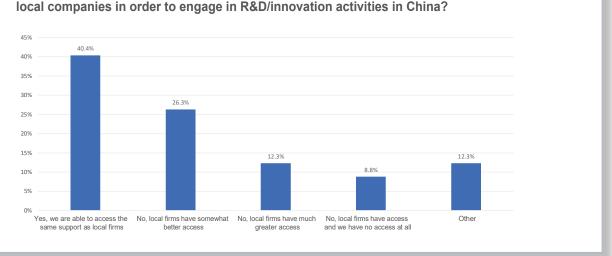


#### 1} Multiple selections possible

Several interviewees reported that they further localised R&D into China explicitly to meet local patent targets and thereby qualify for HNTE status, attainment of which reduces their corporate tax rate from 25% to 15%. Another interviewee had set up their R&D operations independently from their other China operations. Although this made it difficult to obtain HNTE status, they were able to instead qualify for technology advanced service enterprise (TASE) status, which provides many of the same benefits. One pharmaceutical company noted that approvals and certification for new medicines are only forthcoming if a new drug is 'sufficiently innovative' compared to alternatives, with that standard being sometimes quite arbitrary. Finally, equal access to various types of government support for R&D (compared to local firms) was reported by only 40% of respondents who had previously indicated that they had accessed at least some government support.<sup>2</sup>

<sup>2</sup> Specifically, those who did not answer the earlier question of "To the best of your knowledge, from which of the following sources has your company's China-based operations obtained R&D/innovation funding or other resources? (multiple choices possible)" with the response "None of the above".





# Chart 6: Is your company able to access the same subsidies or other government incentives as local companies in order to engage in R&D/innovation activities in China?

### China's domestic agenda increasingly unpredictable and demanding

Implicit political demands are also affecting companies and their localisation strategies, particularly when the demands come through their customers. This is particularly true when key customers are state-owned, as their decisions are often motivated more by politics than market forces.

- **SOEs demand localisation:** One interviewee reported they had been told by an SOE customer that they need to further localise the company's technology and R&D in China to continue to qualify as a 'made in China' supplier.
- A large technology gap helps push back on localisation demands: Another noted that a double-digit
  percentage of their global revenue came from a specific product line that is chiefly sold to Chinese SOEs, and that
  under the 'autonomous and controllable' guidelines,<sup>3</sup> they must onshore both current technology and future R&D.
  The company has so far been able to rebuff this demand, but only because its Chinese competitors are not yet
  close enough in terms of technology and quality, though they expect this could change very quickly.
- Pressure from privately-owned enterprise partners is also growing: A third interviewee said that while pressure to onshore R&D is already growing among their SOE customers, more and more of their private sector customers are also expressing concern that in the future they will come under political pressure to choose suppliers that are fully onshored across the whole value chain.

However, a wide range of specific policies, as well as broader geopolitical trends, are driving both short- and long-term uncertainty among companies considering further R&D localisation into China (see Chart 7).

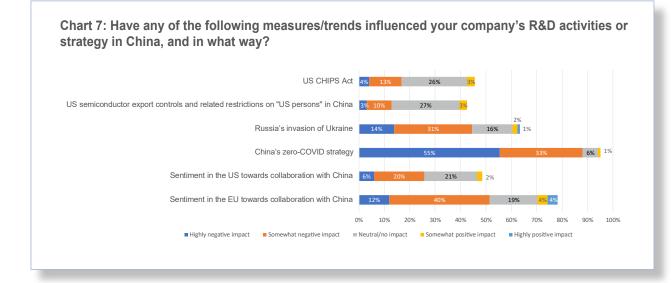
Interviewees widely reported that such unpredictability impacts R&D strategies and how they pursue R&D investments. This can be seen in the year-on-year decrease in how optimistic MNCs are about future R&D spending in China. The time scope for the question asked in the survey for the 2023 report was extended from one year to five years in order to avoid factors such as China's sudden expansion of COVID-19 management measures and the rapid escalation of geopolitical issues from having an excessive influence on the results, and to get a clearer picture of long-term planning. In the 2022 survey, a third of respondents indicated they expected their R&D spending in China



<sup>3 &</sup>quot;Autonomous and controllable" ( 自主可控) refers to a growing principle in China's technology self-reliance campaign to push companies to adopt technologies and supply chains that are not dependent on imported or foreign-supplied inputs. This commonly pressures European companies to localise their technologies to produce them and do R&D locally to remove the risk of foreign governments disrupting access to a given tech through export controls or other restrictions.

to "increase greatly" in the coming year, while only 5.2% of respondents to the 2023 survey expected the same for the next half decade. That does not necessarily mean they are retreating from doing R&D in China, but rather tempering their ambitions – in 2023, 55% of surveyed MNCs said that R&D spending would "increase somewhat" over the next five years, compared to 44% that said the same in 2022, while there was almost no change year-on-year in the number that said they would decrease spending.

The negative impact that China's zero-COVID policy had on R&D activities—as reported by 88% of survey respondents—is expected by most interviewees to diminish over the coming years now that the policy is rescinded, though many noted that this could take years. While it may be possible to now resume R&D personnel exchanges across borders, multiple interviewees are worried that the value-proposition of moving or returning to China to do R&D will be tainted for years to come due to the 2022 lockdowns, especially for R&D personnel that have families. This echoes a point made by several interviewees – that sentiment felt within R&D functions is a reflection of business confidence in general.



As a result of some of China's recent decisions—including crackdowns and rectification campaigns in the real estate and consumer internet industries, and the overnight dismantling of the private tutoring industry—one interviewee expressed that, "[t]he predictability of business in China, which was such a strength for so long, is now greatly diminished." Combined with the negative impact the 'zero-COVID era' has had on business sentiment, and the government's recent tendency to take sudden, drastic action without consultation or advance notice, China's allure as a destination for regional HQs has been eroded. Several interviewees noted that their regional HQs in Shanghai, including for regional R&D, were being reassessed, with Singapore (and its rule of law and reliability in its response to COVID) being viewed as a viable alternative. Similarly, one interviewee noted their global HQ was trying to determine whether their growing R&D footprint in Southeast Asia should be led by their regional R&D HQ in China or the one in India.

### Geopolitics puts European companies in a precarious position

Sentiment in the European Union (EU) and the United States (US) towards R&D collaboration with China is having a negative impact on 52% and 26% of respondents respectively. While the US-China technology war continues to impact technology flows and R&D activities in China through sharp and specific restrictions, the impact on European companies has been limited to the few in those value chains, such as in the semiconductor or artificial intelligence (AI) spaces, or suppliers of targeted firms like Huawei. Instead, European companies worry that their own home governments will increasingly take a tougher line on China with regard to all things related to technology.<sup>4</sup> That also



extends to the valuable exchanges between US- and China-based R&D operations, which could be threatened by these trends.

But the global event raised in multiple interviews as having had the biggest impact on long-term localisation planning in China was Russia's invasion of Ukraine. While the 45% of respondents that identified Russia's invasion as having a negative effect on their R&D strategies in China is a lower rate than those that identified the same for China's zero-COVID policy, interviewees widely shared the opinion that the impact of zero-COVID will eventually dissipate while the impact of the invasion will remain for far longer. One interviewed company that is currently going all-in on R&D in China admitted that the invasion has undermined their confidence in this strategy. They said their overall consideration for investing in localised technology and R&D is, "Can we develop business in China that is sustainable over a long period of time?" The speed with which the sustainability of business in Russia disappeared has cast doubts at every level of decision-making in the company's global operations. Several interviewees connected this topic with fears of a conflict in the Taiwan Strait, or of further instability in cross-strait relations, particularly if US government representatives continue direct, high-level diplomatic engagement with Taipei.

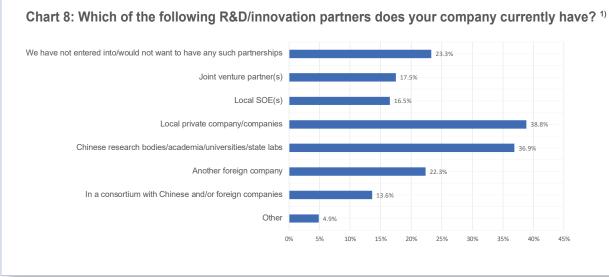
4 The survey took place prior to the announcement of the US-Netherlands-Japan agreement on aligning export controls on specific types of lithography equipment.



## Collaboration a High Risk, High Reward Strategy

One priority of the 2023 survey and interviews was to better understand what kind of innovation collaboration strategies are employed by European companies in China. While 23% of respondents reported that they do not have, nor intend to seek out, collaboration partners in China, the remaining 77% do. The most common collaboration partners are local private companies (39%) and Chinese research bodies/academia/universities/state laboratories (37%). Meanwhile, less common is collaboration with local SOEs (16.5%) and companies' joint venture (JV) partners (17.5%). Interviewees noted that partnering with SOEs is more likely to result in technology leakage, while collaborating with a JV partner could mean empowering a competitor.

Finally, while interviewees overall reported positively on collaboration opportunities, several noted that it has become harder as a foreign company in more sensitive industries to partner with the local firms most capable of delivering results. One specifically reported that they no longer have access to the big players in their field, and are now "going around kissing frogs, hoping that at least a few of them turn into princes". This was reflected in the survey data yearon-year, which saw the share of respondents that identified "an abundance of local collaboration partners" reduce from 56% in 2022 to 32% in 2023.



### 1} Multiple selections possible

Collaboration patterns also differed significantly between SMEs and MNCs. SMEs were more than twice as likely as MNCs to exclusively do R&D in-house. Meanwhile 56% and 66% of SMEs respectively engaged in some form of collaboration with corporate partners either to develop something new, or to fine-tune or adjust an already-developed product; by comparison, 84% and 73% of MNCs engaged in the same kind of partnerships respectively.

Interviewed companies were found to engage in various forms of collaboration with partners in China. These can be broadly categorised as core innovation, complementary innovation and HR cultivation, although the exact dividing line between 'core' and 'complementary' R&D is not easily drawn and is likely to become even more complex over time. Interviewees generally view collaboration with external partners as less risky, for example, when working on complementary digital solutions or helping suppliers refine their own products. However, trends suggest that it will become increasingly difficult to maintain distance between such collaborations and 'core' technologies, with digitalisation set to tie more and more technologies together, and highly refined and resilient supply chains demanding closer and closer collaboration.



Core innovation an internal matter for most, but some report collaboration is worthwhile

Core innovation is undertaken to generate new technology or refine existing technologies that are central to a company's product portfolio; for example, chemical companies working on new materials, or finding new applications of current products. Technology leakage risks in core innovation collaboration are significantly higher than in other forms of collaboration, and the potential damage more serious, as it generally involves companies with the same or similar technologies, which tend to be competitors. On a similar note, several interviewees shared that doing core innovation with partners in research laboratories and universities also presented a significant risk of technology leakage, with some saying that they had subsequently identified jointly developed technology present in their competitors' products.

MNCs were more likely to engage in earlier-stage innovation, including at the basic and applied research levels, which is reflected by the fact that 58.5% of MNC respondents collaborated with laboratories/academia compared to 37% from the general respondent pool.

Collaboration on core innovation is entered into for a variety of reasons, not least to gain an advantage in certain core technologies:

- Laboratory collaboration pays off in more ways than one: One materials company noted that China is investing heavily in R&D of new materials through its research laboratories, and that through collaboration the company can contribute to researcher know-how and also gain opportunities to tap into jointly developed IP.
- Innovating with local firms, then acquiring them: A supplier in the construction industry previously collaborated with local firms to help them refine their technology. Once the technology reached a certain level, the company acquired those firms to fill in certain niches in their own core technology.
- Pharmaceuticals doing earlier stage testing: One pharmaceutical company noted they are collaborating more with local partners to run clinical trials in China, and that they are increasingly doing them at phase two and even phase one<sup>5</sup> as part of a localisation and certification strategy after decades of only doing late-stage trials.

However, there are also reasons for not entering into core innovation collaboration:

- SMEs unwilling to risk their core technology: SMEs were much less likely to engage in collaboration in general, but those interviewed were extremely conservative about core innovation collaboration due to the risk of technology leakage. If an SME only has one or two core technologies in the first place, it significantly increases the damage that would be caused if a competitor obtained it.
- Even some MNCs are highly risk averse: One MNC reported that they do absolutely no core innovation collaboration in China due to technology leakage risks and concerns about strengthening their local competitors that are increasingly going global. However, the same company does engage in complementary innovation collaboration in China.

### Complementary innovation makes up the bulk of collaboration due to lower leakage risks

Complementary innovation collaboration is carried out to supplement current technologies/products that are less directly connected to the core technology of the company that is seeking partners. For example, a chemical company working with an AI startup to develop new digital solutions that will support its sales team. In such instances there is



<sup>5</sup> Earlier phase trials (like phase 1) are more exploratory and focussed on safety, while later phase trials (like phase 3) are at a more advanced stage in drug development and are more focussed on dialing in dosage and measuring longer-term effectiveness.

a lower risk of losing core technology as partners are not in the same core industry. Interviewees suggested that this was a good way to integrate new technologies that would be more difficult to find in Europe, as China leads in many areas in the digital sphere.

Interviews revealed other areas in which European companies collaborated on complementary innovation in order to tap into China's digital strengths:

- Digital platforms add value to traditional industries: A chemical manufacturer worked with Chinese partners to create a digital platform for their customers that allows them to customise combinations of different materials tailored to their specific needs.
- Creating new markets for old technology: An industrial inputs producer collaborated with a local firm that excels at smart-home solutions to better integrate consumer and commercial ventilation systems.

Participating in complementary innovation collaboration can also allow companies to expand the capacity of their suppliers:

- Collaborating to build up a supplier for a new material: One chemical company is aiming to create more circular economy systems in its value chain, and is collaborating with several potential suppliers to help them develop processes that break down certain materials into raw materials the company uses as inputs.
- Partnering with universities to commercialise research: Another industrial supplier noted that they have found several promising technologies developed in university laboratories that had applications that would be useful as inputs for their operations. They helped these laboratories to commercialise that technology and in turn supported the enterprises that were subsequently formed to become suppliers.

Finally, complementary innovation collaboration can also help to accelerate a company's core innovation work:

- **Digital partners can accelerate rollout:** An interviewed pharmaceutical company that previously did most digitalisation-focussed R&D in-house recently found that in China it can more rapidly rollout new solutions that affect R&D, such as digital platforms that facilitate decentralised clinical trials.
- Local R&D can result in products going global: One chemical manufacturer used simulation software tailormade by a local start-up to accelerate commercialisation of their R&D results. The simulation software works so well that they are hoping to integrate it into their global R&D systems, and are currently reviewing relevant rules in China and other jurisdictions to see if this is possible.

### HR cultivation through collaboration with others generates considerable value

As in last year's survey, many firms indicated that recruitment is a concern. Limitations on travel in 2022 did not help with staff rotation and talent development. However, over the longer term, interviewees repeatedly argued that research partnerships fulfil a role in creating a pipeline of Chinese and international talent. This is especially true for early-stage research, with companies leveraging universities and public laboratories to find the right talent in China. As such, collaboration was commonly reported as a means to mentor and build ties with Chinese researchers/ engineers with the hope of attracting them to the company. HR collaboration also commonly takes the form of sending a company's researchers to support a research laboratory, helping both the laboratory and the researchers to develop expertise.

• Sending out R&D talent to universities boosts skills: One chemicals firm has built ties with universities outside of China's tier-one cities, where they routinely send their own researchers and engineers to support laboratories



across the country. This not only helps to develop the staff sent out, but also helps identify possible candidates for their own R&D operations.

- Collaboration to identify and hire young talent: During one interview, a pharmaceutical company noted that it specifically engages in collaboration with universities and research laboratories with the aim of identifying and promoting young talent.
- **Post-zero-COVID spells return of talent transfers:** One MNC was particularly relieved to see China's zero-COVID strategy removed, as it will allow them to revive transfer programmes that bring R&D personnel to China and sends Chinese R&D personnel to other operations globally for a few years. This helps to spread different cultural ideas and methodologies across their global operations, and acts as a strong trust-building exercise between geographically- and culturally-diverse R&D centres.



### Recommendations

### Recommendations and best practices for companies

- China's R&D market is not for everyone, and it is critical to map out where your company—and even its individual technologies—fit within the local ecosystem in terms of risk and reward.
  - One starting point is through benchmarking your company against other foreign companies within the integrator/ market-chaser/withholder/niche-cultivator framework. Doing so requires critical analysis of where your own company's technology stands in relation to China-based competitors.
- For some, China's R&D ecosystem will present greater reward than risk.
  - Such companies can tap into the R&D ecosystem through internal R&D operations that are onshored in China.
  - Collaboration partners in core technology, complementary technology and HR cultivation may be right for your company.
  - However, any R&D collaboration—but especially on core technology innovation—necessitates strict internal security protocols, as well as extensive vetting of collaboration agreements related to IP.
- For others, the allure of China's R&D ecosystem will be overshadowed by the risks.
  - Such companies may want to limit localisation of their R&D, even for internal R&D activities, due to technology leakage risks.
  - However, collaboration on complementary technologies and for HR cultivation should not be dismissed out of hand, as such opportunities can maximise opportunities in the market while presenting minimum risk of core technology leakage.
- SMEs are advised to adopt a very conservative approach to onshoring R&D and technology into China.
  - Risks are significantly magnified for SMEs with fewer core technologies (making any loss of technology more damaging to their business), the protection of which is harder due to limited resources.
  - SMEs that are considering R&D localisation should first integrate deeply into the European business community in China, including through chambers of commerce and foreign OEMs they are partnered with, to better understand and mitigate the risks of entering the market.
- Protecting 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 maturing in relation to patent filing and enforcement. However, it is lagging behind in trade secrets protection, especially instances in which researchers and engineers have gone to work for competitors in violation of non-compete clauses, which 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.
- · Geopolitics are inescapable, including with regard to R&D localisation in China.
  - Staying close to chambers of commerce and industry associations to stay on top of geopolitical developments and their implications can help with strategic planning.
  - Engagement with institutions in Europe, at the EU- and member-state-level, as well as academia, think tanks and civil society, can help companies stay ahead of geopolitical developments.
  - Companies should consider assembling a taskforce to track geopolitical developments and their implications for R&D and technology strategies.
    - This should include personnel from global and regional HQs as well as leaders across corporate departments (operational, management, technology and R&D) to better capture all risks and opportunities.



### Annex

### Comparison with the previous survey

### What changed in 2022?

As outlined in this project's first round of surveys and interviews, the reality for European companies doing R&D in China remains that: it is right for many, but not for all.<sup>6</sup> This year's report echoes and reinforces not only that conclusion, but also that the vibrancy of R&D activities in China remains largely dependent on where a company and its technology fit into the strategic, national goals set by Beijing.

The companies for whom China's R&D is 'right' were consistently more optimistic about their current and future innovation work in China. That includes those in strategic industries such as machinery and chemicals in which Beijing is keen to onshore foreign technology and attract foreign R&D to support China's self-reliance ambitions. It also covers those that fall into non-strategic areas but in which Beijing is eager for investment to drive growth, tax revenue and employment, like the automotive and services sectors. For these firms, China's R&D ecosystem is increasingly important to hone their global competitiveness, and they adopt a variety of strategies to maximise opportunities and minimise risks.

Unfortunately, while China's R&D ecosystem is 'right' for many, there are those for whom it is not. These companies tend to be in industries seemingly identified as 'strategic' by policymakers, in which Chinese firms have closed enough of the technology gap with foreign providers. Once this has been achieved, considerable pressure is then applied to squeeze out foreign competitors to preserve market share for domestic companies. This form of technological substitution through both explicit rules and regulations, and broad political efforts, has seriously damaged European information and communication technology (ICT) players in the market. That European ICT firms are facing not only an onslaught from Beijing, but are also being undercut by Washington in the technology war, has left them between a rock and a hard place. The results of the 2023 survey for the ICT sector echo those from 2022, with a similarly bleak outlook:

- The only two respondents expecting their R&D spending in China to "decrease greatly" are both ICT companies.
- ICT respondents are far less likely to engage in collaboration with various partners on the ground than the average
  respondent, with one exception: that ICT respondents (71%) were far more likely to collaborate with a foreign
  company in China than the general survey respondent pool (22%). Discussions with companies in the sector
  suggest that, at this point, the reason they work mostly with foreign companies is because their former Chinese
  partners have answered Beijing's call to adopt local suppliers where possible.
- 43% of ICT respondents reported unlevel playing field issues compared to 32% of the general respondent pool.

While the general survey results demonstrated that R&D activities in China are more negatively impacted by sentiment in the EU than sentiment in the US, the opposite is true for ICT respondents. This is undoubtedly a result of the focus—and ongoing impact—of both the Trump and Biden administrations' policies directed towards the ICT sector in China.

6 China's Innovation Ecosystem: Right for many, but not for all, European Union Chamber of Commerce in China & MERICS, 8th June 2022, viewed 14th March 2023, <a href="https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/1019/China\_s\_Innovation\_Ecosystem\_Right\_for\_Many\_But\_Not\_for\_All>">https://www.europeanchamber.com.cn/en/publications-archive/Innovation\_State\_Sta



	Highly negative impact	Somewhat negative impact
General survey – US sentiment	5.9%	18.9%
General survey – EU sentiment	11.9%	39.6%
ICT respondents – US sentiment	57%	28.6%
ICT respondents – EU sentiment	28.6%	42.9%

### General survey differences

While it is only possible to make limited comparisons between the 2022 and 2023 survey results due to the significant gap in respondent numbers (32 in 2022 and 107 in 2023), major differences between the findings of the two surveys did suggest changes that were subsequently confirmed during interviews. However, as the 2022 survey was almost exclusively completed by MNCs, a comparison between the 2022 and 2023 data gathered from MNCs makes for a more valuable comparison.

The trend of MNCs planning to substantially increase R&D spending in China seems to be diminishing. In 2022, a third of MNC respondents indicated their R&D spending would "increase greatly" in the coming year. The time scope for the question in the survey for the 2023 report was extended to five years in order to avoid factors such as China's sudden expansion of COVID-19 management measures and the rapid escalation of geopolitical issues from having an excessive influence on the results, and to get a clearer picture of long-term planning. The findings are significantly different, with only 5% of MNCs expecting to increase their R&D spending "greatly" in the next half decade. That does not necessarily mean they are retreating from doing R&D in China, but rather tempering their ambitions – 55% said R&D spending would "increase somewhat" in the next five years, compared to 44% that were planning to do the same in 2022, while there was almost no change year-on-year in the number that said they would decrease spending.

In 2022, 19% of MNCs reported obtaining support from the central government, 37.5% from the provincial government and 62.5% from local governments. In 2023, this had dropped to 7%, 19.5%, and 39% respectively. As this question is not limited to support provided only over the last 12 months, the year-on-year difference is not likely down to a massive decrease in government support. Instead, it may be explained by examining the survey questions about the different types of support available, which showed similar significant differences. For example, almost twice as many MNCs in 2022 reported they had access to HNTE status than in 2023. As such, this could be attributed to the specific (smaller) sample size in the 2022 survey.

MNCs' views on the positive and negative factors of China's R&D ecosystem also generated interesting comparisons. Most of the results from 2022 and 2023 were strikingly similar, except for the following:

- "Sufficient government support" was not selected by any respondents in 2022, but by 29% in 2023. This may be the result of the heavy government support to prop up companies impacted by lockdowns, which included significant outlays to support R&D.
- "Strong local demand for our innovative goods/services" decreased from 67% in 2022 to 54% in 2023. This is likely the result of overall decreases in demand during the lockdowns.
- "Fast pace of commercial application of R&D results" decreased from 78% to 51%, also likely slowed down by zero-COVID-related lockdowns and disruptions to business in general.
- "Insufficient local talent" became a more prevalent issue, increasing from 11% in 2022 to 27% in 2023. Several interviewees noted that domestic travel restrictions made it very difficult to attract the right personnel to work in their R&D centres.



### SMEs vs MNCs key data comparisons

Finally, in the 2023 survey, while a substantive discussion about the differences between SMEs and MNCs and how they engage in R&D in China is included in the main text, some further interesting differences in the survey data can be found below:

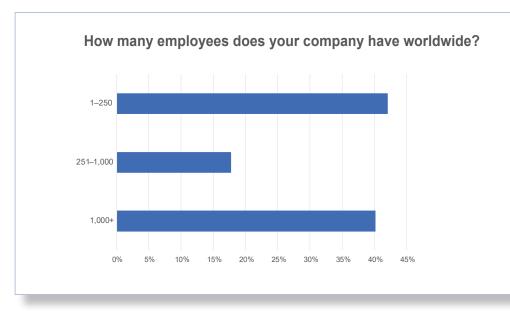
- A third of SMEs reported no R&D spending in China, while only 10% of MNCs said the same.
- MNCs were much more likely to have increased R&D spending in the last five years than SMEs (57% MNCs, 36% SMEs) but were nearly the same in terms of plans to increase spending in the next five years (60% MNCs, 55% SMEs).
- SMEs are more than twice as likely to exclusively conduct R&D in-house (i.e., with no collaboration partners) than MNCs (18% vs 8%).
- Only 5% of MNCs reported there are no factors that positively impact their R&D in China compared to 18% of SMEs.
- SMEs were universally more likely to report "highly negative impacts" from all geopolitical/policy issues than MNCs, except for zero-COVID, which was reported as having "highly negative impacts" by more MNCs than SMEs.
- MNCs universally reported higher access to different types of government support than SMEs.
- While 28% of SMEs reported no knowledge of government support, only 12% of MNCs reported the same.

SMEs				
	Exclusively	Often	Sometimes	Never
Without external partners/in- house	18%	19.7%	44.3%	18%
With a corporate partner to jointly develop something new	3.3%	23%	29.5%	44.3%
With a corporate partner to fine-tune or adjust one of their already developed products/ services for our use	1.6%	16.4%	47.5%	34.4%
With a university or public research institute to jointly develop something new	0%	11.9%	20.3%	67.8%
With a university or public research institute to fine- tune or adjust one of their already developed products/services for our use	0%	8.3%	26.7%	65%

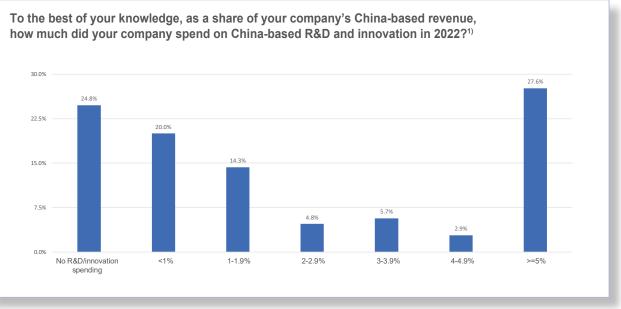


MNCs				
	Exclusively	Often	Sometimes	Never
Without external partners/in- house	7.9%	31.6%	44.7%	15.8%
With a corporate partner to jointly develop something new	8.1%	18.9%	56.8%	16.2%
With a corporate partner to fine-tune or adjust one of their already developed products/ services for our use	5.4%	18.9%	48.6%	27%
With a university or public research institute to jointly develop something new	2.7%	13.5%	54.1%	29.7%
With a university or public research institute to fine- tune or adjust one of their already developed products/ services for our use	2.8%	13.9%	41.7%	41.7%

### Full survey data

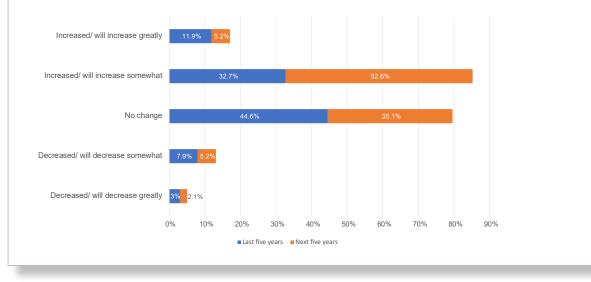




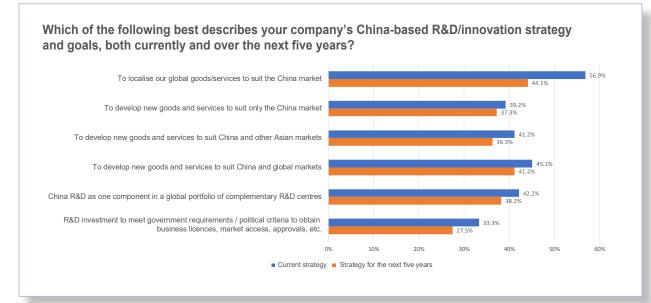


1) Including locally generated funds and funds transferred from HQ and other sources abroad

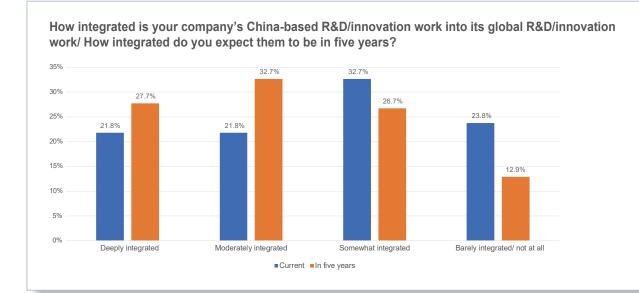
Has your company's share of annual revenue spent on R&D in China changed in the last five years/ How does your company plan to change R&D spending in China in the next five years?





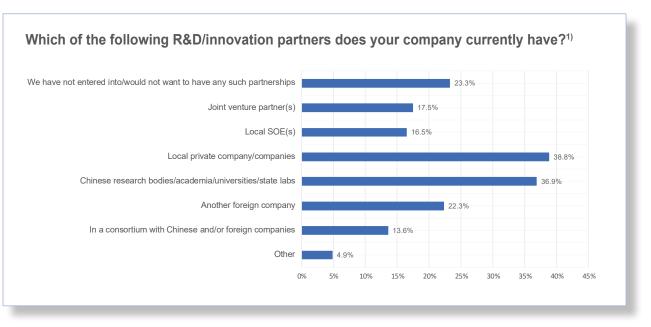


1} Multiple selections possible



How often does your company engage in the following arrangements for R&D/innovation projects in China?				
	Exclusively	Often	Sometimes	Never
Without external partners/ in-house	14.1%	24.2%	44.4%	17.2%
With a corporate partner to jointly develop something new	5.1%	21.4%	39.8%	33.7%
With a corporate partner to fine-tune or adjust one of their already- developed products/services for our use	3.1%	17.3%	48%	31.6%
With a university or public research institute to jointly develop something new	1%	12.5%	33.3%	53.1%
With a university or public research institute to fine-tune or adjust one of their already-developed products/services for our use	1%	10.4%	32.3%	56.3%

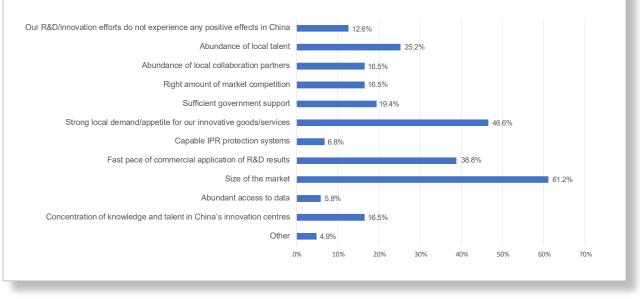




1} Multiple selections possible

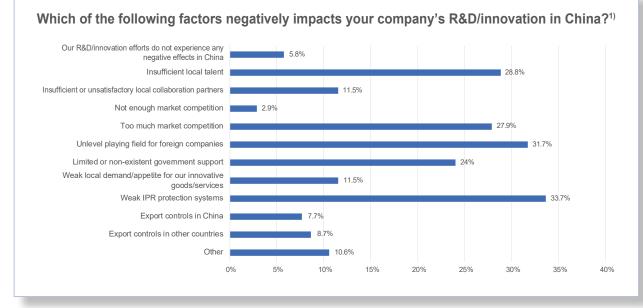
China's Innovation Ecosystem: The localisation dilemma





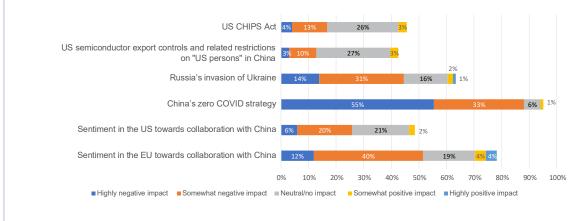
1} Multiple selections possible





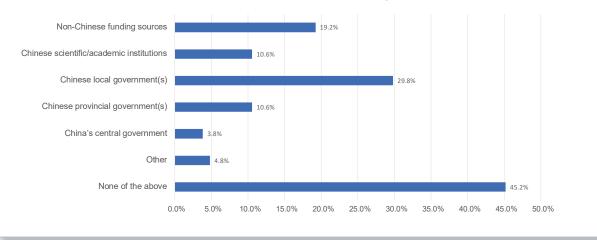
### 1} Multiple selections possible





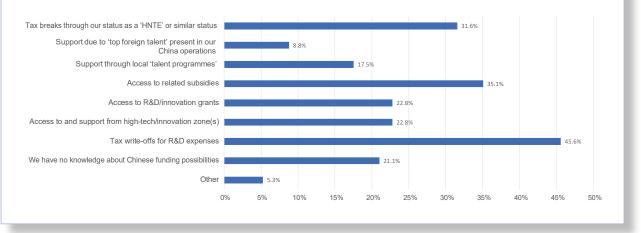


# To the best of your knowledge, from which of the following sources has your company's China-based operations obtained R&D/innovation funding or other resources?<sup>1)</sup>



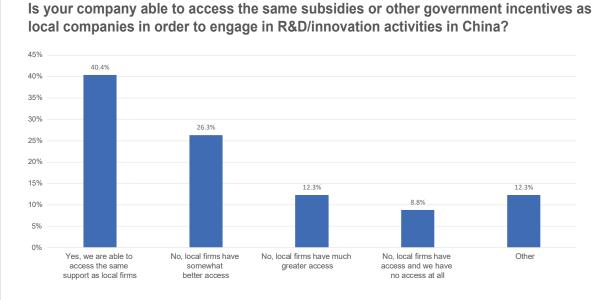
1} Multiple selections possible

# Through which of the following schemes is your company able to access R&D/innovation support from the government?<sup>1)</sup>



1} Multiple selections possible

MERICS



# Is your company able to access the same subsidies or other government incentives as



### **Abbreviations**

AI	artificial intelligence
EU	European Union
EV	electric vehicle
HNTE	high- and new-technology enterprise
HQ	headquarters
HR	human resources
ICT	information and communication technology
IP	intellectual property
IPR	intellectual property right
JV	joint venture
MERICS	Mercator Institute of China Studies
MRI	magnetic resonance imaging
MNC	multinational company
OEM	original equipment manufacturer
PVC	photovoltaic cells
R&D	research and development
SOE	state-owned enterprise
TASE	technology advanced service enterprise
US	United States



### 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 35 working groups and fora representing European business in China.

The European Chamber now has more than 1,700 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.



### Beijing

Tel: +86 (10) 6462 2066 Fax: +86 (10) 6462 2067 Email: euccc@europeanchamber.com.cn

#### Nanjing

Tel: +86 (25) 8362 7330 Fax: +86 (25) 8362 7331 Email: nanjing@europeanchamber.com.cn

#### Shanghai

Tel: +86 (21) 6385 2023 Fax: +86 (21) 6385 2381 Email: shanghai@europeanchamber.com.cn

#### Shenyang

Tel: +86 (24) 6683 4376 Fax:+86 (24) 6683 4376 Email: shenyang@europeanchamber.com.cn

### South China - Guangzhou

Tel: +86 (20) 3801 0269 Fax: +86 (20) 3801 0275 Email: southchina@europeanchamber.com.cn

### South China - Shenzhen

Tel: +86 (755) 8632 9042 Fax: +86 (755) 8632 9785 Email: southchina@europeanchamber.com.cn

#### Southwest - Chengdu

Tel: +86 (28) 8527 6517 Fax: +86 (28) 8527 6517 Email: chengdu@europeanchamber.com.cn

#### Southwest - Chongqing

Tel: +86 (23) 6308 5669 Fax: +86 (23) 6308 5669 Email: chongqing@europeanchamber.com.cn

### Tianjin

Tel: +86 (22) 5830 7608 Fax: +86 (22) 5830 7608 Email: tianjin@europeanchamber.com.cn