INSIGHT.

The Journal of the American Chamber of Commerce in Shanghai - Insight Autumn 2025

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LEVEL UP

How China Plays in the Global Market

Whether in consumer brands, esports, clean energy or biopharma, Chinese companies are making waves.

AMCHAM SHANGHAI

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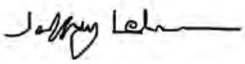
CHAIR'S NOTE



JEFFREY LEHMAN

Chair of The American Chamber of Commerce in Shanghai

Summer is always a busy time for AmCham, and this year was no exception. We celebrated the 110th anniversary of our founding with a memorable gala at the Pudong Ritz Carlton. Our Committees sustained an intense schedule of events on everything from Labubus to coffee to AI. We also hosted our annual signature WeForShe Conference, Automotive Conference and HR Conference.

In June and July, to commemorate the 80th anniversary of the end of the Second World War, we participated in the opening of the Flying Tigers Historical Photo Exhibition in Fuzhou and Shanghai. The exhibition remembers the American volunteer pilots and ground crews who fought alongside Chinese soldiers and civilians. You can see highlights of the exhibition on page 38 of this issue.

In September we published our *2025 China Business Report* (CBR) based on a survey of foreign business that has run since 1999. The highlights of this year's data are on page 21, and members can download the full report on our website.

The week after the CBR's publication, AmCham Shanghai led a delegation to Washington, DC, for our annual Doorknock to share the report findings and the diverse perspectives of our member companies with policymakers and experts. Our interlocutors were not especially surprised to hear the most important lesson from this year's CBR: that geopolitical uncertainty continues to weigh heavily on our members. They readily understood how challenging it is for our companies to make long-term business decisions when the global trade environment is so volatile.

The conversations tended to drill more deeply into what the CBR revealed about the concept of "reshoring." Almost half our members are building resilience by relocating planned investments out of China, but only a small percentage are going back to the United States. Our delegates explained in detail the variety of economic factors that account for these decisions, and what kinds of changes are needed over a longer time horizon to make reshoring a viable prospect.

Our interlocutors were also eager to discuss two findings that have until now not received much attention in DC: the extent to which more members see the Chinese regulatory environment improving, and the increasing strength of domestic competitors — both important reasons why our members want to stay in this market.

One of the high points of the Doorknock was our meeting with Representative Adam Smith. He was gearing up to lead a bipartisan congressional delegation of legislators to visit China, the first visit from the US House of Representatives in almost six years, and he shared his hopes for the trip. The delegation ended up holding a series of productive meetings in Beijing and Shanghai, including a visit to AmCham Shanghai.

I encourage you to read this issue of *Insight* from start to finish. It is chock-full of content that is well worth your time and attention:

- Duncan Wrigley of Pantheon Macroeconomics provides a thorough analysis of the current complex state of the Chinese economy and what to expect as policymakers try to rebalance.
- Former US Ambassador to Vietnam and Assistant Secretary of State for East Asian and Pacific Affairs Dan Krittenbrink provides important insights into US-Asia relations.
- David Fishman offers a detailed analysis of China's decarbonization agenda and how the US can contribute to the next generation of clean technology.
- Danny Tang of Hero Esports introduces the multi-billion-dollar world of esports and why China is the industry architect.
- Alan MacCharles and Mark Schaub crack the code on successful joint ventures in China.
- Dave Xie, Alex Shutter and Shirley Qiu of Oliver Wyman describe how Chinese consumer brands are remaking global markets and the lessons MNCs should take away.
- Richard Brubaker interviews three experts on the sustainable packaging landscape and opportunities for US-China cooperation.
- Janny Wang discusses her decades-long career with leading life sciences firms and how Avantor supports a booming biopharmaceutical industry in China.

This autumn will bring yet another season full of Chamber activities to support our members. I look forward to seeing you there.

Pressure Points

The Consumption Rebalance

Interviewed by Stephanie Sam

Duncan Wrigley is China Economist at Pantheon Macroeconomics. He produces the China+ Service for Pantheon, covering China, Japan and Korea. He was previously Chief Strategist at Everbright Securities International, with a focus on China economic policy research. Before that he worked as an economist at Shui On Land, a property developer headquartered in Shanghai. That followed positions at the Economist Group, Business Monitor International and the Center for Strategic and International Studies. Duncan has a MA in International Relations and International Economics from Johns Hopkins University School of Advanced International Studies and a BA in Philosophy, Politics and Economics from Oxford University. He speaks fluent Mandarin.

What is your GDP growth forecast for the last quarter of 2025? Is China on track to meet its target of "around 5%" this year?

Our Q4 forecast is around 4% but in reality, we expect official GDP growth will still be reported above 5%. That's an indication of two things: skepticism about whether the official GDP data is recording growth properly, as well as worry about trade volatility being the main variable. Domestically, the economy remains sluggish, especially in consumption. Post-pandemic reopening has not restored economic vitality as hoped. Consumer caution persists amid a property downturn and weak labor market. However, manufacturing has helped prop up demand, with Chinese companies now exporting more of their own technology abroad.

Although China's direct exports to the US have fallen due to tariff increases — they are now almost 40% lower than they were late last year — exports to other regions like Southeast Asia, Latin America and Europe have held up better than expected. The US is attempting to counter this trade diversion through measures like stricter transshipment rules and levies on goods rerouted through third countries (for example, setting a 40% levy on transshipped goods in Vietnam that clearly targets China), though the effectiveness of these efforts remains uncertain.

What is your outlook going into 2026?

Another part of the puzzle is what the Chinese government does in response to these issues. The government has traditionally been very responsive to sharp economic downturns such as the global financial crisis. It has historically countered sharp downturns with large, credit-driven stimulus that focuses on property, infrastructure and manufacturing to boost both domestic growth and global commodity demand. Many investors have expected a

similarly big stimulus recently, but policymakers have clearly ruled out such a move. Their reluctance stems from high levels of existing debt among households, corporations and local governments, as well as fallout from aggressive stimulus in the past, such as instability in shadow banking (including peer-to-peer lending or wealth management products). Officials are now much more cautious.

Geopolitical uncertainty, particularly the potential for extreme US tariff measures, also plays a role. Will the US revert to 150%? If so, that would create a big shock to the Chinese economy. China is holding back reserves in terms of what it could do to respond to such external shocks rather than deploying stimulus preemptively.

Do you see China moving closer to a "new normal" of slower but higher-quality growth or is the government still prioritizing headline GDP figures?

Both things are going on. China is prioritizing high-quality production and moving up the manufacturing value chain, evidenced by more Chinese-branded products and increased domestic high-value work, such as chip production and R&D. This shift naturally results in lower quantitative growth, as mature economies like the US or Japan cannot sustain the high growth rates of developing nations. However, this long-term transition to slower, higher-quality growth is being exacerbated by the current cyclical downturn. The property sector crisis is dragging down areas from household consumption (linked to property wealth) to steel and construction. This severe slowdown in traditional sectors creates additional pressure on local officials to meet growth targets, a task far more difficult now than before.

How effective do you expect Beijing's fiscal and monetary policies to be in sustaining growth amid weak domestic demand? How much policy space does the government really have left to support growth given the risk of capital outflows and currency pressure?

China's policies are effective in supporting growth but limited by structural economic headwinds. While recent fiscal measures, like additional borrowing equal to 2.1% of GDP, can support growth, there are only so many worthwhile infrastructure projects to fund, especially during a property crisis.

> "Consumption is the big question. Unlike the US, which used massive direct consumer handouts during Covid to spur spending, China's efforts have been smaller and more targeted, such as trade-in subsidies for appliances and cars."

Consumption is the big question. Unlike the US, which used massive direct consumer handouts during Covid to spur spending, China's efforts have been smaller and more targeted, such as trade-in subsidies for appliances and cars. These subsidies have boosted sales in specific categories, but consumers seem to be shifting spending, e.g., spending less on clothing and other products so they can buy subsidized items. The measures are not increasing consumption overall, rather they are just bringing spending on cars, for example, forward and providing a temporary boost. New policies like subsidized consumer loans will probably have limited impact as consumer sentiment remains near historic lows due to concerns over jobs and incomes.

Large-scale direct handouts are unlikely, as policymakers are wary of creating a culture of people relying on welfare payments instead of working. Instead, economists propose strengthening the social safety net such as by increasing pensions, especially for rural pensioners, and coverage for migrant workers, who generally don't have

> With many projects suspended or half completed, buyers are understandably very wary. If you crunch the numbers, we've still got another year and a half or two years before we clear out the excess housing supply at the national level...to a sustainable level.

equal access to public services such as education, healthcare and housing. Measures like this would directly raise incomes and consumption. However, local governments are the ones footing most of the bill for public services, and they face massive cost pressures despite recent local debt transfer efforts. Meaningful reform would require either redistributing tax revenues or transferring state-owned assets into the social security system — steps that face vested interests and have not yet been taken.

Recent property policy easing in major cities like Beijing and Shanghai have led to expectations of more stimulus, while China's rental housing market is under mounting pressure due to oversupply. How do you assess these recent measures and is it enough to boost the real estate market in the long term?

China has been trying to reduce its reliance on the property market for years, and now with this extended downturn, the government has taken a targeted approach to support the market rather than full-on stimulus. One major reason is that they don't want to risk spurring the property market back into life and returning to the pre-pandemic market characterized by soaring prices and speculation.

Shanghai and Beijing have both recently eased some home purchase restrictions in suburban areas, but there are still limitations in place. We've had easing like this a couple of times before; the last time was in Q4 2024, which resulted in a temporary rise in housing sales led by the big cities — essentially, some pent-up demand was released but then sales tailed off because of the underlying drag. The oversupply and weak demand challenge is most severe in smaller cities as a result of the construction pipeline that started many years ago.

Total home sales have halved since before the pandemic. Some cities still have a decade worth of new home supply, which will take time to clear. Then there is weak underlying demand because of people no longer viewing property as a safe investment, as well as the falling childbirth rate and delayed marriages. On top of all that is the developer crisis, where many firms overborrowed. China has a pre-sale system where around 80% of properties are purchased before they're completed, so buyers have to be confident that the developer will finish the construction if they are to put down a 30–50% deposit. With many projects suspended or half completed, buyers are understandably very wary. If you crunch the numbers, we've still got another year and a half or two years before we clear out the excess housing supply at the national level (including housing currently on sale and projects that have already been started; that doesn't even take into account pre-owned housing) to a sustainable level. We reckon sales will remain not much higher than the current levels, which is around 2009 levels, in the longer term.

▲ The great currency rebalance

China's economic momentum has slowed although exports (to countries besides the US) have remained strong and some metrics show manufacturing activity returning to growth. Is this better-than-expected performance sustainable, or will it falter as the trade war drags on?

This is an area where we are

▲ The rise of gig work

wary of pretending we have the crystal ball. There are several plausible and extreme scenarios, and disputes between China and the US are quite likely, whether a deal is made by November or not. In DC, there is a consensus that China is the biggest geopolitical rival, and that it has been unfair towards foreign investors and companies for many years, whether in IP theft or uneven market access.

Exports from China to the US are already falling because even during the current tariff reprieve, rates are higher than before. The big question is whether China's exports to the rest of the world can hold up. Chinese exporters are more competitive in these other markets, partly thanks to yuan weakening against most major currencies (it has appreciated only slightly against the dollar, while the dollar has weakened significantly against other major currencies since the start of the year) but will those other markets allow the surge of Chinese exports to keep coming to them? All of this points to it being quite unlikely that China's exports can maintain the current level of growth.

There was a mixed consumption picture in the first half of 2025. Can you outline which sectors are experiencing growth despite weak consumer sentiment overall? Can rising household consumption offset slower investment and exports, or will China struggle to rebalance its growth model?

Sectors covered in the trade-in subsidy programs are performing strongly. For example, electric vehicles (EV) are doing well overall despite the price war as units sold have been rising. Sports goods and leisure activities related to tourism are also doing well, driven by consumer behavior that increasingly prizes experiences over goods. Another shift in consumer behavior is that people aren't opting for the glitzy big brand items anymore, but rather for high-quality yet lower cost items.

Consumption will struggle to rebalance economy alone, at least in the short term, because of the drags from the property market and the weak labor market. One risk to the labor market is new rules that came into effect at the start of September, mandating companies to pay full social security payments. A previous loophole had allowed many flexible, delivery and factory workers to be excluded from the social security system, which saved companies money (as contributions can be 25–30% of payroll) and supported employment. While some soft data already indicates layoffs in response to the rules, full enforcement is unlikely as it would cause significant damage to jobs and local economies. Local governments are expected to be pragmatic to avoid this outcome. Yet there is still a hidden risk that many already-struggling SMEs will be forced to lay off workers or close entirely.

> “Exports from China to the US are already falling because even during the current tariff reprieve, rates are higher than before. The big question is whether China's exports to the rest of the world can hold up.”

What are the biggest risks investors should watch in China's macroeconomic environment — and where do you see the most underappreciated opportunities?

For investors looking at the China market, the biggest macro risk is not a sudden financial crisis, but long-term economic stagnation — similar to Japan, which has faced slowing growth, entrenched deflation (especially producer deflation), intense competition, adverse policy impacts and demographic decline. These factors could lead to prolonged stagnation. Additionally, trade tensions remain a major external risk.

Regarding opportunities, China's vibrant tech sector and manufacturing upgrade into high-quality areas like EVs, electronics and ships have been increasingly recognized, as is its potential in robotics and AI. What remains underappreciated is the potential in consumer services such as leisure, healthcare and education, which are underdeveloped compared to other economies. Reforms in social security, hukou, land and finance could unlock significant consumer demand and rebalance China's economy. Long-term growth in sectors like elderly care also offers overlooked potential. I

▲ Dutifully high tariff fees

THE ASIA TIGHTROPE

PERSPECTIVES FROM THE FORMER US AMBASSADOR TO VIETNAM

Based on a fireside hosted by Han Lin, edited by Stephanie Sam

Ambassador Daniel J. Kritenbrink is a Partner at The Asia Group, where he brings three decades of diplomatic expertise and strategic insight into US engagement across the Indo-Pacific. Before joining The Asia Group, Ambassador Kritenbrink served as Assistant Secretary of State for East Asian and Pacific Affairs (2021–2025), where he led US diplomatic efforts across a region critical to global stability and economic growth. Prior to this role, Ambassador Kritenbrink was US Ambassador to Vietnam (2017–2021). As Senior Director for Asian Affairs at the National Security Council (2015–2017), Ambassador Kritenbrink coordinated US foreign policy and White House engagements with critical counterparts across the entire region. From 2013 to 2015, he served as Deputy Chief of Mission at the US Embassy in Beijing, where he was a key player in managing the US-China relationship at a time of rising geopolitical tensions.

Can you tell us about your diplomatic career in China and East Asia that led to your final role as the Assistant Secretary of State for East Asian and Pacific Affairs (2021–2025) before you moved to The Asia Group?

I often joke that I'm not a very good investor, but the best investment I ever made was in myself when I decided to work in China as a diplomat. That meant studying Chinese full-time for two years in the State Department. Then I was assigned to a series of jobs here: I worked at the embassy in Beijing for eight years and was in Washington, DC, as the director of the State Department's China desk. As you noted, I was senior director for Asian affairs [at the National Security Council] during the Obama administration, but I spent at least half my time working on China. It was the same deal when I was Assistant Secretary of State; I was covering the entire region, but half my time was spent on China.

What's most interesting to me when I reflect on my career is how starkly the US-China relationship has changed. When I started working in China in 2005, I joked with my friends that my job essentially was to eat and drink with smart Chinese people. I was a political officer in the internal unit of the political section at the embassy in Beijing. My boss at the time told me that my job was to understand China and then periodically write reports to DC. She made clear that the only way I could learn about China as a diplomat was to get out on the ground.

During those early assignments, eating and drinking with Chinese people, I learned a lot about what makes China tick, and it really provided me with a rich background. Later in my career, when I had briefings with the President or the Secretary of State, I

would often reflect back on those on-the-ground experiences. In later jobs, when I came back to China, I didn't have any time to eat and drink with smart Chinese people; I spent most of my time negotiating with Chinese diplomats. That was an entirely different education.

If you distill all of that, one point stands out: China's rise is the defining story of the past century, or the past 50 years at least. It will define the century going forward and therefore the US-China relationship remains the most consequential but complex relationship. I was honored to play a role in it, and we're going to need good diplomacy and productive channels of communication going forward.

As you reflect on the arc of evolving geopolitical tensions today, how would you define where we are in the US-China relationship?

I'm deeply concerned. The US-China relationship today is an uneasy, fairly unstable truce in the midst of the tariff and supply chain war that kicked off earlier this spring. Both sides have recognized that the relationship today is primarily competitive, and we are grappling with each other to figure out what that means. And in the US, there is a raging debate about how we should respond to China and what kind of a relationship we should have with it.

What continues to give me a sense of optimism is that every US president since I became a diplomat has either recognized from the outset, or come to recognize through painful experience, that China isn't going anywhere, and we have to find a way to live alongside one another. This is the most consequential, complex relationship. It defies a simple slogan or a bumper sticker. In the second Trump administration, it's increasingly clear that what we need right now is stability. That's not where the Trump administration started, but I think that's where it's landed.

Earlier in September, there was a phone call between President Xi and President Trump. What was the significance of that call in relation to stabilizing US-China relations?

> "This is classic US-China diplomacy: set a roadmap of leader-level meetings, use those encounters to cut deals, and let the calendar itself create an incentive for restraint."

As a former diplomat, I firmly believe in talking with one another and keeping channels of communication open. While I agree that America's shift toward a more realistic and tougher China strategy over the past decade is warranted and perhaps overdue, I worry we risk overreacting. We need to stay clear-eyed and unapologetic that this is a competitive relationship, with serious concerns about certain Chinese policies that run counter to US interests.

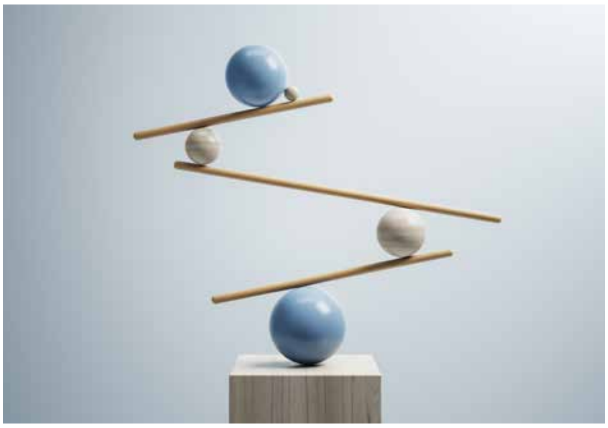
The key point is that our two countries are enormously significant to each other and to the global economy. A miscalculation that leads to conflict would be catastrophic, so engagement is essential. Some in the US argue that talking to China is meaningless — that it wastes time and distracts from stronger countermeasures. I think that view is dangerous. That's why the phone call between President Trump and President Xi was reassuring.

There's no doubt that tensions between

Washington and Beijing are intensifying. During the first eight months of the Trump administration, we experienced a roller-coaster: a fierce tariff war (with tariffs [imposed by the US and China] climbing to 145% and 125%, respectively), followed by a supply chain war in which China cut off exports and the US imposed new technology controls. Both sides proved they could hurt each other. When US markets began to wobble, President Trump seemed to recognize that while he had goals — reindustrializing the US, rebalancing trade with China, and more — he also needed to avoid pushing too far.

Since April/May, we've seen a clear uptick in diplomacy, especially between US Treasury Secretary Scott Bessent and Chinese Vice Premier He Lifeng. That channel has been productive, covering not only trade and investment but a wide range of issues, and it has helped stabilize the relationship. The call in June between the two presidents, at the height of the supply chain tensions, directed their senior envoys to find a way forward.

Diplomats on both sides are now explicitly saying they want stability, something I hadn't heard earlier this year, when the rhetoric was far tougher. President Xi had responded to US pressure with equal force — [emphasizing] that China is able to endure pain and "eat bitterness" a lot longer than the US can — but the uncertainty ultimately caused both sides to step back. The latest call suggests we're entering a new, more stable phase.



▲ Stability is key

The Chinese side invited President Trump to visit Beijing in the interim period between the East Asia Summit in Malaysia and the APEC Summit in South Korea. As I understand it, the administration was worried about time constraints to put a trip together. I've been on a lot of presidential trips including those to China; they are major undertakings, not just logistically but also strategically [if you want] to see significant progress on the main trade issues and other concerns like the fentanyl crisis and the TikTok issue.

For now, the plan is for the two presidents to meet on the margins of APEC, with Trump visiting Beijing early next year and Xi visiting the US later. This is classic US-China diplomacy: set a roadmap of leader-level meetings, use those encounters to cut deals, and let the calendar itself create an incentive for restraint.

In short, the recent call shows both leaders have decided, at least for the near to mid-term, to pursue stability. That's encouraging for businesses and for the broader trade and investment relationship.

But let's be clear: the fundamentals haven't changed. The relationship remains complex and contentious, and any diplomatic schedule can be derailed. Still, compared with a few months ago, both sides are now clearly focused on maintaining stability.

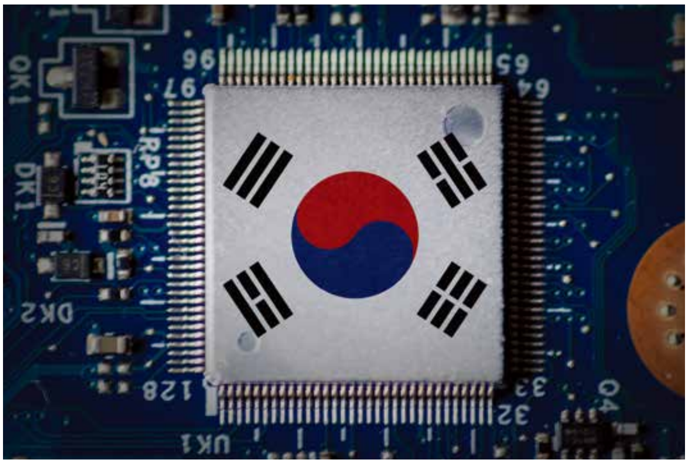
As you outlined, stability is key. Do you think the Trump administration will continue to implement the current global tariffs in 2026? What potential changes do you foresee?

What's striking is how the world seems to have settled into a situation in which most countries are generally comfortable with reciprocal tariffs of at least 15–20%. If I had predicted a year ago that everyone would accept 15–20% tariffs, people would have thought I was crazy. Yet when we saw the reciprocal tariff rates imposed on what was called "Liberation Day" on April 2, many countries were shocked at how high they were.

It's important to note, however, that the administration uses different types of tariffs. Sectoral tariffs are stickier and clearly aimed at bringing production back to the US, and the administration has been less flexible in adjusting those. Reciprocal tariffs imposed under the International Emergency Economic Powers Act (IEEPA) have mostly been used as leverage, but I don't see them going to zero. Negotiations between April 2 and August 1 suggest a floor of about 15–20% for most countries.

Two other points are worth watching. First, the use of IEEPA to impose tariffs is being challenged in US courts. The Supreme Court will rule this fall, and if it limits the president's authority to use that tool, it could complicate negotiations. Second, a number of national security investigations under Section 232 of US trade law — covering pharmaceuticals, semiconductors and other areas — could lead to new tariffs even if reciprocal tariffs remain stable.

China is a special case. By my estimate, the effective US tariff rate on Chinese goods, counting everything over the past decade, is around 55%, while Chinese tariffs on US goods are roughly 30%. Chinese officials tell me they find this tolerable, though they'd like to lower it and are considering strategies to secure an additional 20% tariff relief if the fentanyl issue is resolved. On the US side, many officials — including President Trump, who said on the campaign trail that 60% is "about right" — believe the current levels are appropriate. I don't expect a significant reduction coming soon.



▲ South Korean chips caught in the middle of the US-China competition

How will the US-China race to tech supremacy impact existing US alliances or partnerships in Asia overall?

The US-China technology race is probably the most intense area of global competition right now. Many countries in the region are eager to play significant roles as well, especially Japan, South Korea, Taiwan, and even Malaysia and Vietnam. Consider the comprehensive strategic partnership the US launched with Vietnam in 2023: much of the joint statement between President Biden and the late Vietnamese leader Nguyen Phu Trong focused on helping Vietnam succeed in the semiconductor supply chain.

"Traditional American foreign policy treats alliances as our greatest asset — relationships often forged in wartime decades ago. Yet in recent trade negotiations, some partners feel they've been criticized or subjected to tougher and more punitive measures than some of America's adversaries."

This broader trade tariff dynamic has left many US allies and partners surprised, disappointed and even shocked that they haven't received the level of attention or privilege from the Trump administration that they were accustomed to. Traditional American foreign policy treats alliances as our greatest asset — relationships often forged in wartime decades ago. Yet in recent trade negotiations, some partners feel they've been criticized or subjected to tougher and more punitive measures than some of America's adversaries. Those frustrations have been visible and unsettling for our partners.

That said, negotiations with Japan, South Korea, most Southeast Asian partners and Taiwan have largely landed in an acceptable place, even if many agreements remain unannounced. The initial concerns have eased somewhat, but friends in the region still feel uneasy. They worry they lack the access and protection within the Trump administration that they once enjoyed and fear they are seen less as partners and more as competitors.

India is the notable example. For at least two decades, Washington has worked to build a strong, productive partnership with New Delhi in one of the region's most important strategic shifts. Some observers claim that era is over and that Washington has driven India into Beijing's arms. I think that's overstated. Still, there has been White House frustration, leading to 50% tariffs on Indian goods and some sharp words exchanged. Encouragingly, the US Secretary of State and Indian External Affairs Minister Jaishankar have been negotiating behind the scenes. I'm cautiously optimistic the relationship will recover, even if some uneasiness in New Delhi lingers.

Finally, whether we're discussing strategic issues or trade, I don't see the region reacting in simple binary terms. Countries aren't likely to say, "Washington pushed us, so we'll run to Beijing." More likely, they will diversify their partnerships and balance their relations with China in complex ways. That doesn't necessarily mean dramatic shifts in foreign policy or investment strategies, but it does mean a more nuanced, multi-directional approach. I

Q&A

Interviewed by Stephanie Sam

THE CLIMATE CHESSBOARD

COMPETITION AND COOPERATION ON THE PATH TO NET ZERO

David Fishman is Principal at The Lantau Group. His areas of expertise cover regulatory and economic intelligence for the Chinese power sector, including solar, wind, coal, nuclear, hydro, transmission grid, and power markets. His specific project experience includes Chinese power market and policy intelligence and forecasting, solar and wind tariff policies, renewable asset transactional due diligence, China business matchmaking, and green power procurement support for multinationals operating in China. He holds a joint MA from Johns Hopkins SAIS and Nanjing University in International Relations and Energy Policy. He is a native English speaker and fluent in Mandarin Chinese.

What is the outlook for China's energy consumption for the rest of 2025 and ahead?

China's energy consumption has been expanding every year at a high rate that is typical of a developing country. Historically, electricity consumption has been closely correlated with GDP growth; for many years, as the economy grew, power use grew in tandem. In China, this relationship was very strong until recently. Over the last three years, electricity demand actually exceeded GDP growth, with energy consumption up around 6% versus a 5% increase in GDP. The scale of this growth is significant. China already has the largest power sector in the world, and an annual increase of 5–6% means adding the entire energy demand of a place like Germany each year. The US power sector, while large, is smaller than China's and grows at about 1.5–2% per year, in line with its more moderate economic expansion.

Looking forward, this growth is expected to continue. The industrial portion of electricity consumption is tightly linked to economic output, so as industrial GDP rises, power use in that sector follows closely. Growth in the services sector is also correlated, though it is more susceptible to weather influences since hotter temperatures, like we've had recently, cause additional demand. Residential consumption is almost entirely driven by weather patterns. Therefore, if GDP is forecast to grow at 4.5–5%, it's reasonable to expect a similar growth rate for electricity consumption, with an additional increment due to increasingly hotter climates and industrial electrification substitution.

How has China's energy mix evolved this year? How is China balancing its climate commitments with energy security, especially given its continued coal plant approvals in 2025?

China's overall energy mix is slowly diversifying away from fossil fuels, though coal remains the largest component. Coal consumption had been expanding steadily until roughly the last 12 months, when it appears to have flattened. This is due to contractions in cement production, a flatlining steel sector, tepid growth in petrochemicals, and slower power consumption growth — the main coal-consuming sectors.

Meanwhile, analysts predict that petroleum demand will likely peak within the next year or two. Oil use for passenger vehicles has already peaked due to the rise of electric vehicles, though long-haul trucking and aviation still contribute some growth. Natural gas, though a smaller part of the mix, is expected to continue expanding, mainly for industrial feedstock and heating in northern China.

When it comes to power — which accounts for 60–65% of coal consumption and emissions — demand in China grew by approximately 600 terawatt-hours last year. In comparison, Germany's entire annual consumption was about 500 terawatt hours. Remarkably, around 85% of this growth was

“In fact, coal generation is currently down 1% year-over-year, meaning clean energy sources have not only met all new demand but have also begun displacing fossil fuels.”

met by new clean energy, equivalent to the entire annual electricity demand of Germany or Japan. The remaining 15% was supplied by fossil fuels. This year, wind and solar are being added at record amounts and are expected to meet all the annual growth in electricity consumption. In fact, coal generation is currently down 1% year-over-year, meaning clean energy sources have not only met all new demand but have also begun displacing fossil fuels.

There are two prevailing views on coal capacity expansion. One is that new coal plants are necessary to back up variable renewables like wind and solar, even if they operate at low-capacity — around 40-50% — and only run when renewable output is low. This argument is very common in state media. The other view contends that sufficient backup capacity already exists within the system, but it is unable to be tapped due to lack of market integration. Proponents of this view say that better grid integration and power market reforms can make new coal plants unnecessary by enabling more efficient resource sharing across regions.

How does China's performance compare to energy consumption on a global level?

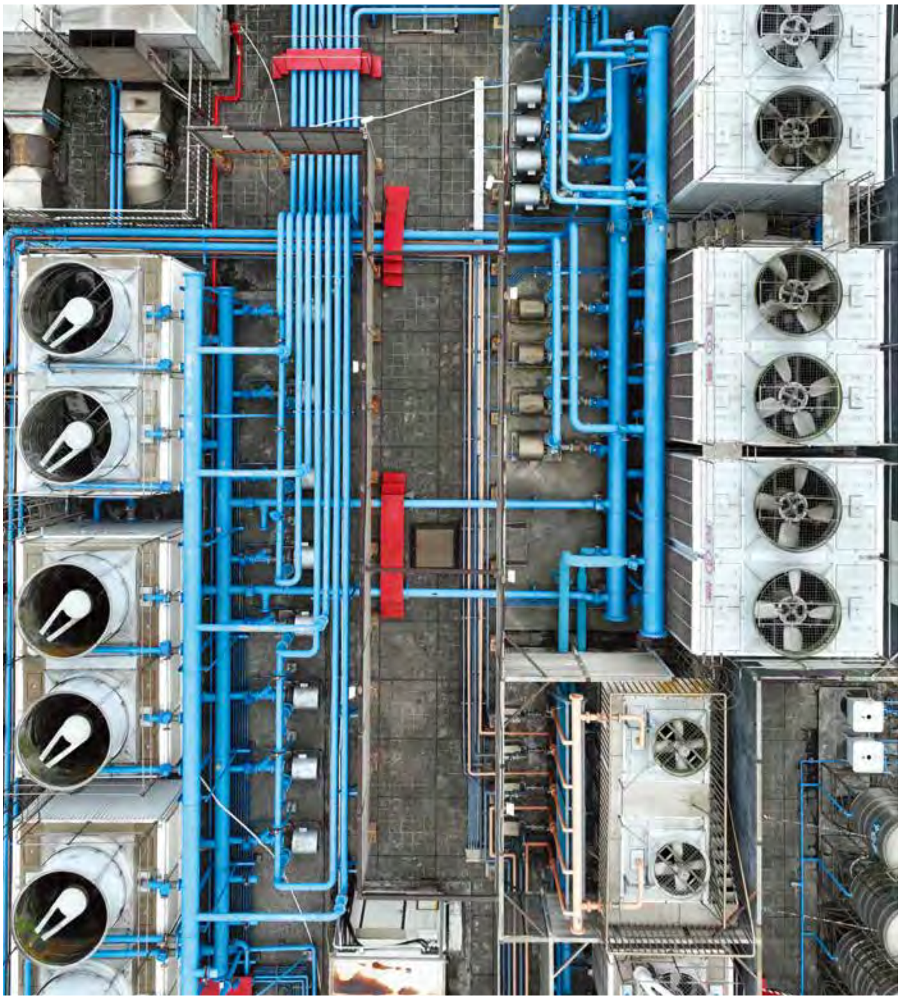
Most of Europe has made significant progress in reducing the fossil fuel share of its energy mix and lowering the carbon intensity of its grid, though often at a high cost. Germany, for example, has faced considerable challenges after phasing out nuclear power. Some grids, like Denmark's, have excelled due to exceptional natural advantages such as abundant offshore wind, allowing clean transition without extreme price spikes. Many European countries were initially able to switch easily from coal to natural gas. However, the war in Ukraine highlighted the geopolitical risks of gas dependency, particularly on Russia, prompting a scramble for more secure and sustainable alternatives.

The US has made rapid progress by replacing coal with gas, which is a step toward decarbonization though not a long-term solution. Australia is also performing well, leveraging its outstanding wind and solar resources, though a fierce debate over nuclear energy continues to polarize public opinion. Across the broader Asia-Pacific region, however, the situation is less encouraging. Many Southeast Asian economies lack robust long-term decarbonization strategies. While some new wind and solar projects are underway, overall energy plans remain heavily reliant on coal and gas. The path ahead will be challenging.

How is China leveraging fast-paced AI innovations to drive its shift toward sustainable energy?

China's focus has been on data centers. The AI value chain demands different types of data centers, which range from low-latency facilities for rapid inference and immediate responses to high-capacity compute clusters for training and non-urgent, queued tasks. This diversity drives the need for massive, energy-hungry infrastructure built in specific locations. Some must be near population centers for speed, while others can

▼ AI data centers, fueling the energy boom



be situated remotely on the other side of the country, closer to inexpensive and abundant energy resources.

Accordingly, China is building a network of eight national computing hubs: three on the energy-scarce east coast where a rapid response time for financial trading is needed, and five in the inland regions with better resource access for bulk computing, like AI model training. These hubs now consolidate roughly 70% of China's data center compute power and are expected to absorb 65-70% of future data center growth. Crucially, starting next year, they will be mandated to source 80% of their electricity from renewables.

Data center growth creates a massive demand for electricity, which, in China's case, helps absorb existing power overcapacity — a problem so severe that some provinces have halted new wind and solar projects to avoid wasting electricity. But the challenge of transmission remains. Moving power from renewable-rich regions like Gansu to meet demand elsewhere (like on the east coast) requires ultra-high voltage (UHV) lines, which are expensive, slow to build, and face complications with land usage rights. Although China's state grid companies are rapidly building infrastructure, generation capacity has wildly outpaced grid development. The country met its 2030 goal of 1,200 gigawatts of wind and solar six years early. There's no way that the physical infrastructure could have kept up.

This mismatch has left wind and solar farms "marooned," looking for a load. To sell their power, they must feed it into an often-congested grid and send it across the country, adding transmission costs that can make the electricity uncompetitive with local generation by the time it reaches the east. When this happens, power generation may be "curtailed," or wasted. Since curtailment rates are a key performance indicator for provincial and municipal officials, many are now reluctant to approve new renewable projects and risk raising wastage rates.

China has, for the first time, set renewable energy mandates for the steel, cement and polysilicon industries, as well as for some data centers as you just mentioned. What do these renewable energy consumption quotas in each province mean for foreign companies operating in China? Which Chinese provinces are leading China's green transition, and which are lagging behind?

Foreign-owned companies operating in China are subject to national regulations. This includes the Renewable Portfolio Standard (RPS), or renewable consumption quota. If a company meets the criteria, it must comply by procuring green electricity. This can be done in two ways: by physically purchasing green power or by consuming standard "brown" power and purchasing an equivalent amount of unbundled Green Certificates to meet municipal requirements (which vary across provinces).

Companies must be prepared to demonstrate compliance with contracts for green power or green certificates, with the national average around 20% of power consumption, though specific quotas are set at the provincial or municipal level. For example, a steelmaker in Chongqing might face a 15% non-hydro or 22% total renewable quota. Quotas are tailored to each province's available renewables. The greenest provinces — like Sichuan, Yunnan, and Qinghai, which are rich in hydropower — have the highest quotas, capped at 70% renewables (including hydro). Conversely, provinces with weaker resources, such as Beijing or Shanghai, have lower targets. Guangdong's quotas were recently increased much more rapidly than expected because the province built a ton of solar power.

2025 is the first year — a test run — that heavy industries like polysilicon, cement and steel have been included in the RPS. Full compliance will be enforced starting in 2026. The finalized annual targets for the current year and the estimated targets for the next year are released each July, allowing companies to plan ahead. Since most power procurement contracts for the following year are signed in December, companies must secure their green power contracts then. Waiting until the compliance year means resorting to unbundled certificates. While valid for Chinese compliance, these certificates are considered the weakest form of verification by international initiatives like RE100, as they don't represent a physical reduction in brown power consumption; you are still using coal power.

The growth in clean power generation led China's carbon dioxide emissions to decline for the first time in Q1 2025. Is this finally the peak and is this sustainable to reach China's long-term targets?

Ideally, we want a clear trend where new wind and solar generation fully meets all additional energy demand, leading to a net decrease in coal usage. This trend must persist every quarter and every year for the foreseeable future. If it fails for even a single year, emissions could spike again, causing many to dismiss the previous decline as merely a transient peak.

At the end of 2023, I had predicted a peak in emissions in 2024, but I was early by about a year. This was largely due to an unexpected crash in hydropower output in the third quarter, which forced coal to fill the gap. This situation highlights a key vulnerability in that the energy transition is partially reliant on weather patterns. It is also dependent on economic activity; if energy-intensive industrial sectors ramp up, power demand could spike beyond what new renewables can meet. The

▼ Coal power, still a major workhorse of China's energy mix

volumes of renewable energy we are adding are massive, but I now hedge my predictions with caution. Data shows that total economy-wide emissions — including from steel, cement, petrochemicals and transportation — have flattened since around March 2024. However, for this to hold, all the necessary conditions must continue to align.

China's clean energy subsidies are a major factor in Western policymakers' concerns about industrial overcapacity. How will this tension impact the US' own energy strategy and how should the US compete with Chinese green development?

The US is well within its rights in wanting a competitive domestic industrial base. But building such a sector is not the work of a single election cycle, or even four; it is a multi-decade endeavor. China's solar photovoltaic dominance, for instance, was built over roughly 20 years through concerted effort at every stage — from mining and fabrication to talented engineers increasing efficiency for price-driven scaling.

My view is that the US should not attempt to catch up in this generation of clean tech, such as solar, electric vehicles or current-generation batteries. China now produces the cheapest clean energy technology in the world. Relying on a protected, more expensive domestic industry will slow clean energy deployment, and from a climate perspective, we cannot afford to delay. We are no longer debating 1.5˚C. The fight is now to stay below 3˚C — a level that would submerge Pacific Island nations and reshape the planet.

If our top priority is breakneck pace deployment of clean energy technology, then that means using the most affordable and scalable solutions available, even if it comes at the expense of certain domestic sectors. Unfortunately, political will in the US is lacking. When key leaders, such as Secretary of Energy Chris Wright, openly dismiss climate change, it becomes nearly impossible to build policy around urgent decarbonization.

> "The US is well within its rights in wanting a competitive domestic industrial base. But building such a sector is not the work of a single election cycle, or even four; it is a multi-decade endeavor."

A more effective strategy for the US would be to contest the next generation of clean tech. Rather than throwing money at industries where the competitive advantage is already lost, the US should focus on pioneering the technologies that will define the 2030s and 2040s, such as hydrogen electrolyzers, carbon capture, advanced biofuels and green ammonia. The goal should be to assertively contest and potentially carve out a lead in fields that are still in the pre-commercialization stage, where the playing field is level and everyone is still figuring out the "special sauce."

One example is green methanol, which can be used as fuel in shipping or feedstock for other processes. While companies like Maersk are beginning to use it, the entire supply chain is still being invented. Green methanol requires cost-effective green hydrogen, which in turn requires massive renewable energy projects. By ordering methanol-powered ships, Maersk is creating demand that incentivizes producers like Sinopec to build the necessary infrastructure from the ground up. This is where opportunity lies — not in producing established commodities like standard (gray) methanol, but in building the green fuel value chains that are still in their infancy.

The US has a chance to compete in this next generation of renewables, but only if it invests heavily in R&D and demonstration projects — and aligns its industrial strategic priorities around supporting and enabling what are often capital-intensive, high-risk plays. China is already funding large-scale pilots in green steel, carbon capture and industrial electrification. Europe is doing the same, though at a smaller scale. The US however, is pulling funding at the exact moment it should be de-risking these ventures. Private capital often won't fund such uncertain, long-horizon projects alone. State support is essential. I testified before Congress to urge exactly this: help American innovators bridge the gap from research to real-world prototypes. Instead, funding was cut, and the focus shifted back toward coal. The next Green Deal should be about backing bold ideas, not retreating to the past. Without that vision, the US will not only lose the current clean tech race — it will miss the next one. I

▼ Soaking up the sun, one kilowatt at a time

Q&A

GAMING REIMAGINED

THE GLOBAL RISE OF ESPORTS

Interviewed by Stephanie Sam

Danny Tang is Co-Founder and CEO of Hero Esports. She was formerly Hero Esports' CFO and Head of Global Strategy Office. Danny plays a pivotal role in shaping the strategic vision of the company, guiding its growth across multiple markets. Before joining Hero Esports, Danny worked at the US and China offices of Kohlberg Kravis Roberts & Co. from 2007 to 2010 and served as Vice President at China Development Bank Capital between 2010 and 2014. She holds a BA in Economics & Mathematics from Bryn Mawr College and a Master of Science in Management from Stanford University. In 2022, Danny was recognized as one of the Top 100 Asian-Pacific Women-Powered Leaders by J.P. Morgan and Ernst & Young. In 2024, she was inducted into the Esports Hall of Fame by the renowned esports media outlet Esports Insider.

What exactly are esports and how are they different from video games?

Esports, or electronic sports, refer to the organized, competitive side of video gaming. It involves professional players and teams competing in structured tournaments, often at a global level. These events are highly regulated, with rules, schedules, and large audiences — sometimes even broadcast worldwide.

In contrast, regular video gaming can be casual or recreational — playing for fun, without any formal competition or organization. While anyone can play video games on PC, consoles, or mobile devices, esports elevates this to a professional sport, with substantial prizes. For example, the 2025 Esports World Cup had a prize pool of around US$70 million, so the stakes are incredibly high, making it a serious and highly competitive industry.

Esports is a high-growth industry estimated to be worth around $1.6 billion globally, but China remains the largest market. What are the key industry trends and where do you see the biggest growth opportunities for the global esports ecosystem?

China has a massive base of gamers and an exceptionally active gaming community. The country benefits from a strong ecosystem of professional teams, established clubs, experienced game publishers, and a deep pool of talent. This comprehensive structure has allowed esports to grow rapidly, turning China into a global leader in both player participation and industry development.

When we founded Hero Esports in Shanghai in 2016, we had the vision that esports would become the future of sports as gaming became more integrated into daily life. At that time, this idea was considered ambitious — esports was perceived as a niche sector associated mostly with young male gamers. Over the past nine years, however, we have seen the professionalization of players in China, who are increasingly trained and recognized as athletes. In parallel, the audience has diversified: competitive gaming now appeals to a much broader demographic, with gender distribution among players and fans approaching parity. At offline tournaments, we often see more female than male fans, which underscores the mainstream appeal of esports today.

This evolution has also reshaped the commercial landscape. Esports is no longer seen as a niche vertical for investment, but as a broad pop-culture movement that resonates strongly with youth audiences. As a result, not only traditional technology and

▲ Asia's largest esports tournament, the Asian Champions League (ACL) 2025, in Shanghai

gaming brands but also mainstream sectors such as dairy, energy, and consumer goods have entered the space. Their engagement has fueled the industry's rapid expansion, helping to elevate esports from a small subculture into a major global industry.

▲ Welcome to the new era of experiential gaming

How is China's esports/gaming industry driving global growth, and what role do companies like Hero Esports play in this expansion?

China's role has evolved from being just a massive market to becoming a genuine global architect for the esports industry. This growth is being driven on three key fronts: competitive legitimacy, exportable ecosystems, and inherent globalization. And companies like Hero Esports are right at the heart of that.

Firstly, the push for competitive legitimacy has been crucial. Recognition of esports as part of the sports landscape has shifted quite significantly in recent years. Esports titles were played at the Jakarta Asian Games in 2018, and more recently, as a medal event at the 2022 Hangzhou Asian Games. This trajectory is set to continue with the Aichi-Nagoya Asian games in 2026. But the absolute game-changer is the International Olympic Committee's announcement of the inaugural Olympic Esports Games in 2027; that's the highest level of institutional recognition possible. It validates esports on the world's biggest stage, and China's competitive fervor and organizational experience have been key in proving this model is viable and valuable.

Secondly, and this is where Hero Esports plays a direct role, China has spent over a decade building a sophisticated esports ecosystem. What we've developed in China over the past nine years can serve as a model for newer esports markets. We've moved beyond just playing games to mastering the entire surrounding architecture: how to structure leagues for maximum excitement, how to produce broadcast content that rivals traditional sports, and how to create authentic partnerships between brands and the gaming community. For example, at Hero Esports, we've developed proprietary technology for live-streaming and fan engagement that creates a seamless viewer experience. We've refined formats for tournaments that build narrative and rivalry. We are actively working to deploy this technology and these formats in newer esports markets, helping them skip years of trial and error. We're not just participating in the global market; we're helping to build it.

Finally, and perhaps most importantly, the industry is driving global growth because esports itself is inherently global. Gamers don't see borders. They communicate and compete across nationalities, genders, and cultures because they all share a common language the moment they log into the game.

China is actively promoting esports as a key driver of consumption-led growth in its innovation strategy. What strategies are leading esports companies using to

capture international markets while maintaining dominance at home?

As leading companies expand internationally, our role is to act as a bridge between Asia and the rest of the world. Many global stakeholders look to China and Asia, where esports has grown rapidly, and see significant long-term potential. By positioning ourselves as partners in Asia, we can help international organizations enter this market while also connecting our strong domestic ecosystem with other developing regions. For example, earlier this year we launched Asia's first multi-title, large-scale Asia Championship League to foster cross-border competition.

Another key trend is the growing recognition of the value of international esports IPs. Beyond initiatives like the Olympic Esports Games, Saudi Arabia has emerged as a notable example: it launched the Esports World Cup, identified esports as one of its five national development strategies, and committed to building global-scale competitions for professional clubs. This reflects a wider industry ambition to expand esports beyond national boundaries into truly global ecosystems.

How is AI driving innovation in esports and gaming? And how is Hero Esports leveraging AI to enhance the audience's experience?

AI is transforming esports by making production more efficient and fan experiences more immersive. Over the past two to three years, we have applied AI alongside extended reality technologies such as VR and AR to streamline live production, build virtual screens and enhance content — for example, by animating player avatars in our tournaments. These tools help us deliver more authentic and engaging experiences to audiences.

At Hero Esports, we also are leveraging AI to deepen fan engagement and reveal the human side of competition. Through our partnership with Qualcomm, we are developing algorithms to interpret esports athletes' micro-expressions, heart rates, and other subtle signals that are not easily visible. By translating these into visual effects, we allow fans to connect more closely with players' emotions, creating a more immersive and emotionally engaging viewing experience.

What challenges does the esports industry face?

One major challenge will be the global disparity in infrastructure. In China and much of Asia, audiences largely skipped the console era and embraced mobile gaming as the primary platform. However, this model doesn't translate seamlessly globally.

The entire premise of mobile esports is frictionless access — competing anytime, anywhere. But this requires ubiquitous, high-quality connectivity. In many regions, without robust 5G or affordable data plans, players can't reliably participate. If you have to hunt for a Wi-Fi signal at a coffee shop just to play, it defeats the core purpose of mobile gaming and severely limits its potential to become a true part of the pop culture fabric in those markets.

Hero Esports is bringing Tomorrowland, an internationally renowned electronic music festival, to China with its first-ever indoor show in November. How is the rise of experiential consumption among gamers influencing esports and mainstream entertainment collaboration?

▲ Winner takes all

▲ Beyond the screen and into the sound — a fusion of EDM and Esports

"The Magic of Tomorrowland" will be held on November 22 in Shanghai as the first-ever Tomorrowland indoor show in China. It will also be the first time that esports and electronic music are merged in one experience. This collaboration is a perfect example of how the lines between digital and physical worlds are blurring, driven by a fundamental shift in what our audience values. It's no longer just about consuming a product; it's about investing in a memorable, shareable experience.

The outdated stereotype of the solitary gamer has completely dissolved. Gaming is now a universal pastime, and with the rise of experiential consumption, anyone you meet is likely a gamer. This cultural shift is why the connection between esports and EDM feels so natural. Both are core passions for a generation of digital natives who actively curate their identity through diverse immersive experiences, from competitive gaming to music festivals.

Hero Esports' sister company Hero Games co-published *Black Myth: Wukong*, a single-player action game that broke global records last year. What does its success mean for the future of the Chinese gaming industry?

The global success of *Black Myth: Wukong* was remarkable, but not unexpected for those who had witnessed its quality and creativity from the start. Even years before launch, its promotional media had already set a new standard and generated worldwide anticipation. The only question was whether the developer could deliver — and they did, turning the game into a landmark achievement.

Its success reflects the rapid evolution and growing ambition of the Chinese gaming industry. A generational shift is underway, as developers who grew up immersed in gaming now bring an intuitive understanding of what makes games great. This new wave of creators is producing higher-quality titles and more engaging experiences that resonate globally. *Black Myth: Wukong* also signals a broader trend for the future of Chinese gaming. It shows that Chinese developers and publishers can create world-class content and compete at the highest level, reinforcing the industry's confidence and shaping a more global role in the years ahead. I

▲ Experiential consumption at its finest

▲ "The Magic of Tomorrowland" will bring together music and innovation in an immersive indoor experience

2025 HIGHLIGHTS CHINA BUSINESS REPORT

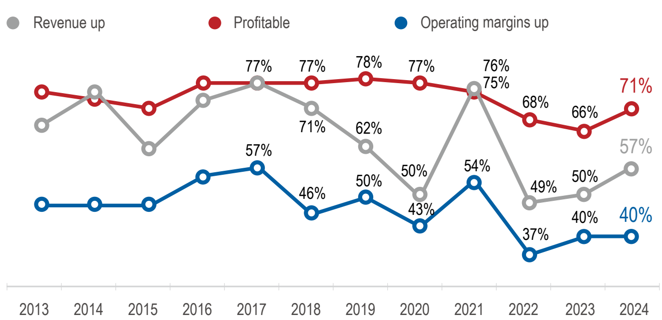
Highlights of The AmCham Shanghai *2025 China Business Report*

This year's *China Business Report* was based on a survey of 254 AmCham Shanghai members. Below are some of the report's highlights.

Profitability recovers and revenue boosted but margins are pressured

After a record-low rate of 66% had posted profits in 2023, members saw a decent rebound in 2024, with 71% of members profitable. Revenue performance improved in 2024, with 57% of members achieving year-over-year growth — up from 50% in the previous survey. However, 30% of members saw margins deteriorate and one-third noted lower margins in China than globally, reflecting intensifying domestic competition and price pressures. Looking ahead, just 45% of members expect revenue to increase in 2025, a record low if realized. And nearly two-thirds (64%) anticipate the trade war will directly weigh on their top line, with manufacturers (74%) hit hardest.

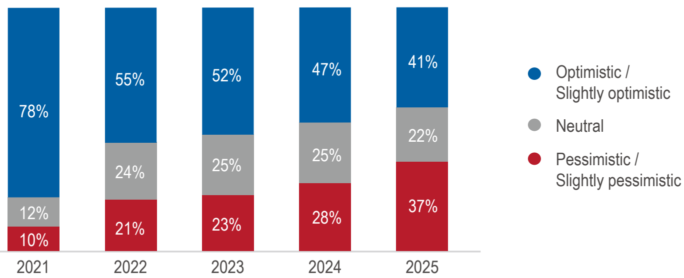
Historical summary of business performance:



Another historic low for five-year business optimism

The rate of members expressing confidence about the five-year business outlook in China has, for the fourth consecutive year, hit a record low. Now, just 41% (down 6 pp) are optimistic or slightly optimistic, while an all-time high of 37% respondents (up 8 pp) are pessimistic or slightly pessimistic.

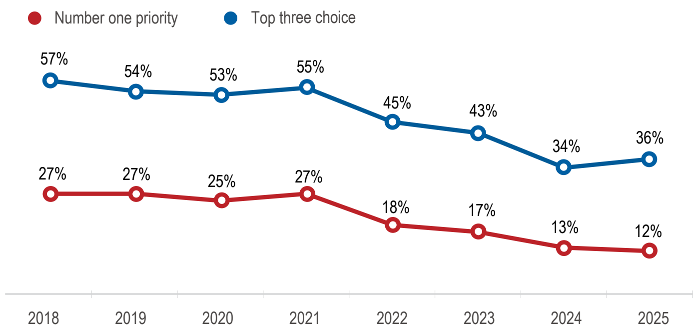
How would you describe your five-year business outlook in China?



Lower prioritization of the China market continues

Simultaneously, only 12% of respondents said their parent company ranks China as their top investment destination. This de-prioritization is striking considering the rate ranking China a top destination was 27% as recently as 2021.

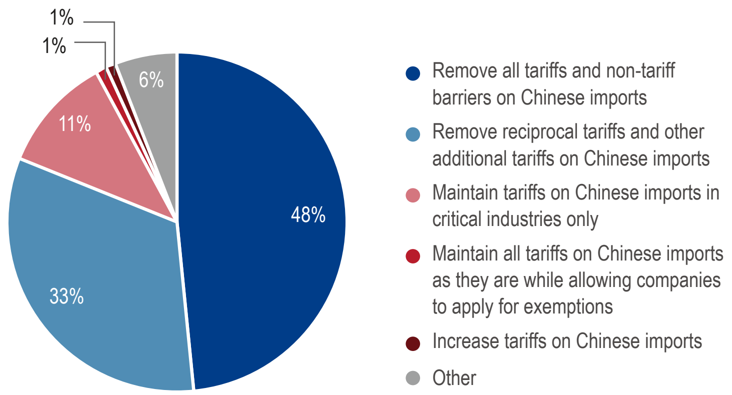
Parent company ranking of China in global investment plans:



The US-China relationship remains the biggest concern for members, and members urge tariff removal

Asked to identify the top challenges to their China operations over the next three to five years, 66% chose US-China tensions. Nearly half (48%) of respondents urged the US government to completely remove all tariffs and non-tariff barriers on Chinese goods. Another 33% want the removal of April's reciprocal tariffs and other additional tariffs, such as the 20% fentanyl tariff. Members also oppose retaliatory duties, with 42% calling on the Chinese government to remove all tariffs and non-tariff barriers on US imports and an additional 34% hoping for a return to the most favored nation rate.

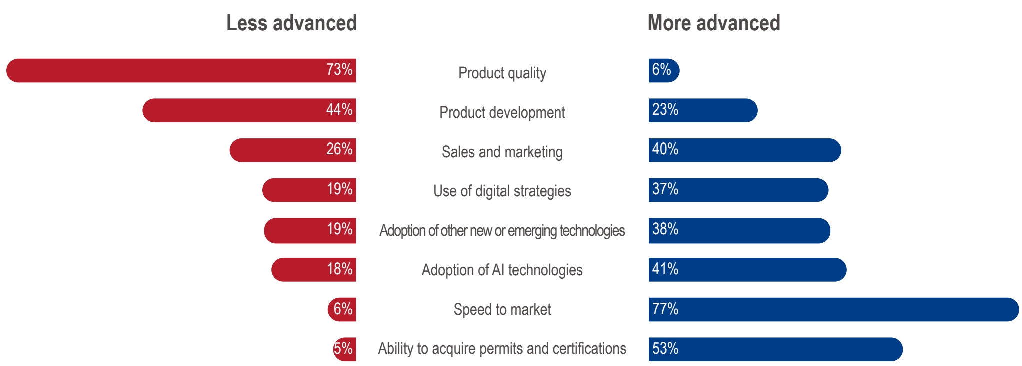
Which action from the US government would be most helpful to your business operations in China?



Increasing domestic competition is a huge worry

Domestic competition (63%) surpassed China's economic slowdown (57%) this year as the second biggest challenge to members' China operations. Of those to whom the metric was applicable, 77% expressed that Chinese competitors are more advanced in speed to market. And when asked about the adoption of AI technologies, 41% of members (and 62% of retail and consumer firms) thought Chinese firms are more advanced.

Compared to your company, how do you rate your Chinese competitors in the following business areas?



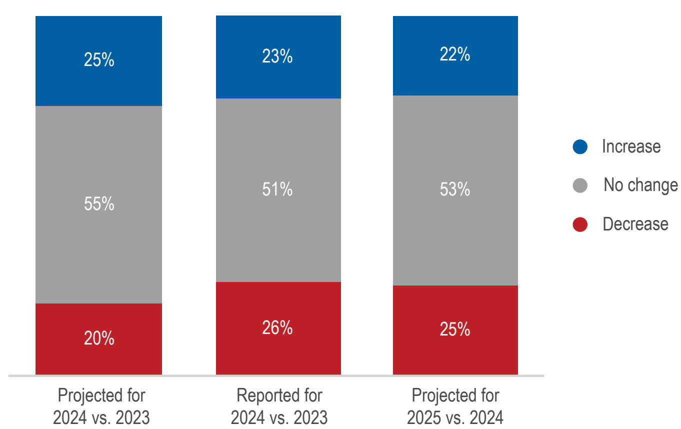
Significant progress in regulatory issues brings market opening confidence...

Several metrics related to the Chinese regulatory environment improved, indicating solid progress in policymaking and enforcement. Over one-third of respondents say that Chinese government policies and regulations toward foreign companies have improved in the past few years, 4 pp higher than 2024. Almost half of respondents (48%) said that the regulatory environment was transparent for their industry, up significantly from 35% in 2024 and 33% in 2023.

But geopolitical uncertainty weighs on investment decisions

Recent turbulence in the global trade environment has made foreign companies less willing to invest in China. Last year, 23% increased investments while a record-high 26% cut investments in China. This year, 22% are expecting to up their China investments while 25% will decrease investment. In the past year, 47% of companies have redirected planned investments away from China, the highest level since this question was first asked in 2017, and Southeast Asia remains the top destination.

How is your company's investment in China changing in 2025 compared to 2024?



Automotive Conference

AmCham Moments

DC Doorknock

HR Conference

Launch of *2025 China Business Report*

Summer BBQ

July to September

WeForShe Conference

THE JV KEY

HOW TO CRAFT A SUCCESSFUL INTERNATIONAL JOINT VENTURE

Dr. Alan MacCharles leads the Lifelong Learning and Executive Education Program at Duke Kunshan University (DKU). Prior to joining DKU, he had a career spanning almost 28 years with Deloitte, the last 18 of which where in China where he was Strategy and M&A partner. He is also an active advisor on the role of geopolitics/instability in business and has been an active speaker with Fortune 500 CEOs on the topic – and the corporate response. Over his career, he has been involved in dozens of joint venture formations, hundreds of commercial due diligence projects, and numerous strategy engagements. His clients have spanned financial services, life sciences, hospitality and manufacturing.

Mark Schaub is an International Partner at King & Wood Mallesons focused on FDI, cross-border M&A, IP and PE in China. He advises on projects in sectors like automotive, autonomous cars, consumer, life sciences and tech, with deals from US$500,000 to over $1 billion. Since 1993, he has handled over $20 billion in projects. His work includes acquisitions, compliance, disputes and corporate advice. He also advises zones on attracting European and Middle Eastern investment. Mark lived full time in Shanghai from 1993 until 2018 and joined King & Wood Mallesons in 2000 as its first foreign lawyer. Mark has been consistently awarded Asia Law's "Lawyer of the Year" for corporate work.

In the late 1990s, the international joint venture (IJV) was the preferred approach for Western companies entering the China market. In most cases, it was not legal restrictions that drove the formation of IJVs but rather the IJV was seen as a means to strategically lower risk (e.g., benefit from the local partner's knowledge, resources, network and sales channels.) In some cases, there was a strong business case to team up, such as a special opportunity, access to a unique asset, to strengthen control over an essential part of a supply chain, or gain immediate connections to customers.

However, most IJVs were fraught with challenges, primarily due to a mutual lack of understanding between the Chinese and Western partners on how to work together. They became less common as more companies sought to go it alone via wholly foreign-owned enterprises. Yet the China of 2025 is fundamentally different from China in 1995. Today's IJVs are often solutions to a very different set of issues.

Why are we seeing more JVs in China?

As geopolitics has become more complex and globalization is being reshaped, IJVs are re-emerging as a potential solution to a host of new challenges, both global and as well as China-specific. IJVs are favored for several reasons:

- **Legal requirements.** China's limitations on foreign investment have narrowed over time, but sensitive or highly restricted sectors still exist. Whereas a decade ago an IJV was often the only option for those wishing to enter China (e.g., in car manufacturing, financial institutions and trading), many of these restrictions have disappeared completely. For example, trading has gone from a highly restricted sector to one of the easiest in which to establish an entity. However, pockets of restrictions remain — the restricted business area may be closely adjacent to part of a bigger business — and IJVs often remain the only viable structure to operate in China.

- **Practical requirements.** Formal legal restrictions have liberalized, but practical restrictions and disadvantages continue to perpetuate an unfair playing field remain. In many cases, particularly if the customer is a large state-owned enterprise (SOE) or funding is state-backed, participating in major tenders is limited to Chinese-funded companies or at most, Sino-foreign JVs. For this reason, international companies wishing to target these lucrative public sectors will often establish a JV.

● **China's got it, we want it.** Increasingly, international companies are not simply heading into China for its vast market but because they believe that to be successful globally, they need access to the next wave of Chinese technologies and products, and this will often be best achieved with a JV. The electric vehicle sector is a clear example where Chinese players (such as BYD, NIO and XPeng) are setting benchmarks not just in cost-efficient battery manufacturing but also in the sophistication of in-car software, user interface design and "smart cockpit" systems that integrate voice, gesture and AI-driven assistance in ways many Western brands struggle to match. This has led top German automakers to enter into JVs with Chinese partners just to get access to this technology. The same can be said for battery technology, where Chinese companies dominate global supply chains from advanced lithium-iron phosphate cells to next-generation solid-state research.

Beyond mobility, green energy and life sciences are industries where China has shifted from follower to frontrunner. In oncology, for instance, dozens of Chinese biotech firms are developing novel therapies for global clinical pipelines, with many MNCs striking JV or licensing deals to bring these products into Western markets. Recent examples include collaborations between AstraZeneca and Chinese biotech Harbour BioMed, or the joint development of PD-1 inhibitors that first gained traction in China before being exported.

● **Make in China for China.** Trade policy was once the purview of bureaucrats negotiating in the shadows over customs code, quotas and standards. This is no longer the case. President Trump has turned yawn-generating trade policy into a hybrid of a "Deal or No Deal" gameshow. His reasoning for tariffs was to reshore manufacturing to the US, but the reality is unlikely to unfold as intended. Some American companies have resorted to establishing JVs in China to serve the Chinese market as a by-product of the high reciprocal tariffs. One US-based client is currently establishing a JV with its China distributor to localize most of its manufacturing while limiting the supply of core US-made components. Other companies are looking at building resilience in key parts of their global supply chain.

● **Supply chain resilience.** Recent trade friction has made companies realize that they may also need to strengthen their links with Chinese suppliers in addition to diversifying their supply chain. This often happens by way of a minority shareholding and may even include plans for the Chinese supplier to "go global" with their foreign customer. Even if the Chinese products may no longer be easily exported, their know-how and expertise can be. One recent example is a US high-end fashion company which realized time to market was key in their industry. Their material was printed in relatively small batches by a highly specialized Chinese supplier. They had long worried that this arrangement: 1) put them at risk if their only site was shut down (Covid); 2) put them at risk if pricing and shipping changed (Trump tariffs); and 3) slowed their operations down. The solution was to establish a small JV in Los Angeles to print the designs on their material.

● **The semi-retreat.** Geopolitics and trade friction have not led to a boom in cross border investment. Rather, there has been an uptick in JVs to solve these new problems. Few large MNCs would be willing to fully exit from China; it is too big a market to just quit. As a result, some are selling down their stake — in most cases to a trusted local partner. Ideally, they pocket some money on the way out but more importantly they retain some influence and keep a foot, or in some cases a toe, in the market.

How to ensure successful JVs

We have set out below 11 key negotiation points that arise in almost every JV negotiation. By understanding these critical topics, business professionals can better prepare to balance their objectives with the realities of crafting sustainable partnerships. They are applicable not only to the Chinese market but to IJVs around the world.

1. Scope, contributions and exclusivity

▼ Successful IJVs require much more than a firm handshake

Every IJV begins with defining the scope of the business: What will the venture do, and within which boundaries? Partner contributions — whether cash, intellectual property, operational expertise, or physical assets like factories and land — form the foundation of this conversation. These contributions signal commitment levels and can reduce competitive tensions. However, they also pave the way for discussions around exclusivity clauses, competition restrictions and territorial agreements.

Critically, a narrow focus ensures resources are directed effectively, while flexibility to expand the scope can accommodate future success. Misalignment here can create deep-seated trust issues, as one partner may perceive the other as withholding essential assets or hedging their risk.

2. Measure of success

Establishing clear success metrics early on ensures both partners are aligned on the IJV's goals. These measures, whether financial (such as revenue targets) or operational (such as acquiring specific licenses or creating a product by a defined date), guide both short-term performance and long-term exit strategies.

Defining success also plays a critical role in dispute resolution and exit triggers. For example, agreeing that sustained financial losses signal failure removes ambiguity in deciding when to part ways. However, successful partners should also update success metrics dynamically to ensure alignment across the IJV's lifetime.

3. Equity split, control and governance

Who controls the JV, and how will decisions be made? These questions center on the division of equity and governance. A common and risky misconception is the assumption that a 51% equity stake guarantees control. In reality, such control is often limited by legal minority rights, reserve matters and supermajority requirements. Additionally, local partners often wield considerable influence due to cultural, operational and geographic proximity, irrespective of their formal equity share.

Effective governance structures including board composition, approval matrices and management appointments must balance influence between partners while ensuring operational efficiency. A successful structure often combines oversight, flexibility and carefully delineated responsibilities, including veto (unanimous consent) powers for critical decisions. In certain markets such as China, specific roles like the legal representative or handlers of the official company stamp carry significant power. Mismanaging these roles can severely undermine governance frameworks.

4. Accounting consolidation

Accounting consolidation affects financial reporting and is often cited as a non-negotiable term by one or both parties. Western companies, valuing "asset-light" models, may seek to avoid consolidating an IJV's financials into their books to prevent adverse impacts on key metrics or triggering debt covenants. Conversely, local partners may desire consolidation to bolster their financial statements.

While governance mechanisms often dictate consolidation, poorly designed structures aimed at avoiding consolidation can limit decision-making power and lead to higher risks. A common solution for large, asset-heavy IJVs is the two-entity "Op Co/Prop Co" model (shown in Figure 1), separating operations and physical assets into different entities. While effective, this structure adds complexity and cost.

5. Valuation and goodwill

Determining how much partner contributions are worth is both an art and science. Unlike mergers and acquisitions, IJVs rely on ongoing cooperation, making it vital to negotiate valuation fairly without undermining trust or future collaboration. Contributions such as intellectual property, distribution networks and government relationships often carry subjective value, adding to the challenge.

In larger deals, partners may defer specific valuation disputes by agreeing to appoint third-party valuation agencies based on pre-defined methodologies. Yet, nuances such as "goodwill" — defined as the premium paid over an entity's book value — frequently add friction. SOEs, for instance, often resist goodwill recognition, seeing it as a liability.

6. Entity structure design (corporate tree)

A well-designed corporate structure enables flexibility, tax efficiency, dividend flows and operational simplicity. Diagrams that illustrate ownership relationships can facilitate stakeholder understanding while acknowledging unanticipated issues. Key decisions include whether the IJV should be incorporated onshore (in the jurisdiction of operation) or offshore (for tax and legal advantages), and whether a single or dual-entity structure (e.g., the Op Co/Prop Co model) is appropriate (see Figure 2). However, overly complex structures or those that overly prioritize tax efficiency can bog down operations. Ensuring alignment between partners' goals and the structure of the IJV is critical for long-term success.

7. Dispute mechanism and exit provisions

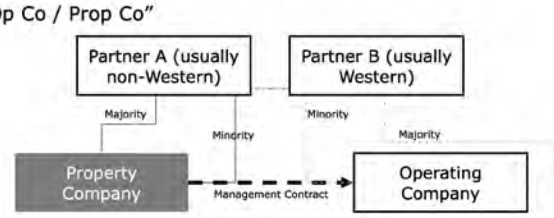
Exit strategies are essential to every IJV but are often neglected during initial negotiations. Typical triggers include financial underperformance, board gridlocks or irreconcilable differences in vision between partners. Provisions such as call/put options (the right for one partner to buy or sell their stake), contractual buyout terms or mutual unwinding agreements must be customized. Specific attention should be given to local legal enforceability if an SOE is involved. Partners should also prepare for worst-case scenarios like fraud, mismanagement or being locked out of financial access. Preventing problems through robust governance, transparency and proactive dispute resolution is preferable to relying on post hoc legal measures.

8. Intellectual property and know-how

Protecting intellectual property (IP) and know-how is one of the most difficult challenges in IJVs. While patents, trademarks and other "hard IP" are easier to define and protect contractually, "soft IP" like operating processes, customer relationships and R&D capabilities tends to leak more easily. Negotiators must fortify protections, particularly in technology transfers, by setting clear usage limitations, export restrictions and provisions around state-

Figure 1

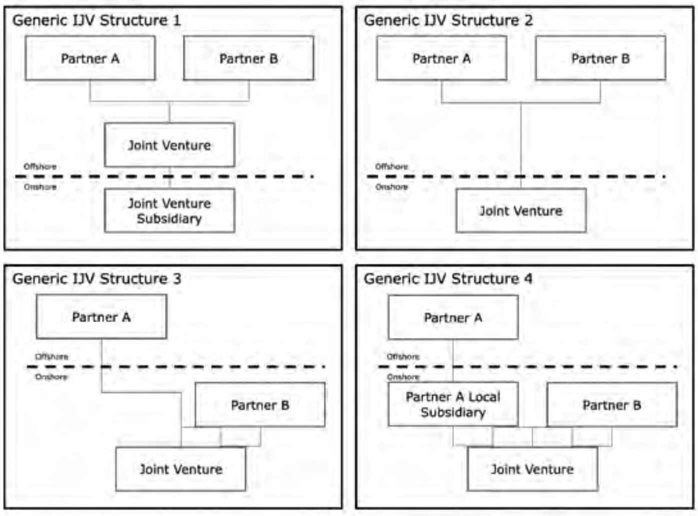
"Op Co / Prop Co"



of-the-art updates.

Chinese IJVs are likely to generate their own IP as they implement use of a technology in China. Such IP is often related to scaling up or different applications but is invariably valuable. It is crucial to contractually deal with this aspect in advance so as to avoid disputes or issues later on. The more nuanced the agreements are, the better the IJV can safeguard sensitive trade secrets and the Western partner can ensure rights to additional IP arising from the foreground technology.

Figure 2



9. Related party transactions

Partners that intend to use the IJV as a customer, supplier or service provider must navigate the thorny issue of related party transactions. Carefully negotiated agreements — based on transparent, arms-length pricing — can prevent mistrust and disputes, particularly around perceptions of undue advantage. For example, a partner supplying inputs at inflated costs to an IJV can erode trust and appear exploitative. Meanwhile, underpriced goods may leave profits disproportionately in one partner's hands. A balance must be struck, with built-in review mechanisms to ensure fairness over time.

10. Regulatory issues

Compliance with both local and international regulations is non-negotiable for any IJV. International anti-corruption statutes, export restrictions and sanctions, for example, often clash with the operational realities of local partners. Sanction regimes can be difficult to align; in some cases, companies will need to risk either US sanctions or engage in activities which may bring the wrath of the Chinese regulator. These issues can become especially delicate when partnering with SOEs. To avoid misunderstandings or operational risks, regulatory requirements should be outlined clearly early in the negotiation process. Achieving synergy will depend on legal expertise and cultural understanding.

11. Dispute resolution

All IJVs in China need to follow Chinese law. There are some cases where Chinese and Western companies incorporate the IJV in an offshore jurisdiction such as Hong Kong and then have the IJV hold the China business, but this is rare and usually ineffective. Parties have more options when selecting jurisdiction for dispute resolution. The vast majority of IJV contracts in China would explicitly state arbitration rather than local courts since judgements by the latter are difficult to enforce, whereas arbitration has an enforcement framework under the New York Convention. Partners will often opt for neutral jurisdictions such as Singapore for arbitration. Selection of the dispute site is often emotive, but the location is unlikely to make much difference. It is important under Chinese law to select a specific arbitration body/center rather than just a location. Otherwise, the clause is likely be found unenforceable.

▲ China's got it, we want it, EV style

Lessons for the business community

Every IJV negotiation represents a dynamic interplay of strategy, compromise and cultural understanding. To increase the likelihood of success, businesses should focus on four key practices:

1. **Preparation:** Anticipate key issues and understand interdependencies between negotiation points.
2. **Flexibility:** Know your non-negotiables but be willing to trade concessions to achieve your broader goals.
3. **Transparency:** Build trust through clear, open mechanisms for valuation, control and dispute resolution.
4. **Cultural literacy:** Recognize and respect local norms, operational environments and communication styles when entering foreign markets like China.

At its core, crafting a functional IJV requires balancing the black-letter details of contracts with the qualitative nuances of relationships. By focusing on the evolving needs of the business and maintaining trust with your partner, legal, operational and financial challenges can all be managed effectively. Of course, the best contract cannot prevent a JV from failing from poor governance implementation, which we discuss, along with many other aspects of JV formation, in more detail in our book *Unlocking International Joint Ventures: Keys to Formation Success Through Cultural, Commercial and Legal Decision Making* from Wiley Press (2024), which you can find by scanning the QR code below.

As the old adage goes: Partnerships are like marriages. They are easy to initiate, but their success depends on sustained effort, collaboration and shared goals. The IJV contract is like a prenuptial agreement — it's essential but ultimately only the foundation for a much larger journey. I

WHAT CHINA'S RISE TEACHES GLOBAL BRANDS ABOUT GROWTH

Dave Xie is a partner at Oliver Wyman based in Shanghai, bringing extensive expertise in corporate and growth strategy for retailers and consumer brands across China and Asia. He specializes in corporate strategy, competitive analysis, growth and expansion, e-commerce operations, category management, and channel strategy. With a strong focus on the dynamic markets of China, he has successfully led numerous high-impact projects for some of the world's leading consumer brands and platforms and has recently expanded his expertise into the e-commerce sector. Dave holds a business degree from the Chinese University of Hong Kong.

Alex Shutter is a partner at Oliver Wyman based in Shanghai. He has over 10 years of experience in consulting both in Europe and across Asia-Pacific and has resided in Shanghai since 2011. Alex's work focuses on the retail and consumer goods industries as well as the consumer-facing aspects of other sectors, notably hospitality, leisure and online services. He works primarily on corporate strategy, route to market and commercial effectiveness topics, particularly on how changing consumer behaviour affects these areas for clients. He holds a Masters in Chemistry from the University of Oxford, UK.

Shirley Qiu is an Engagement Manager at Oliver Wyman's Shanghai office with over eight years of consulting experience in the retail and consumer goods sectors. She specializes in strategic planning, channel strategy, consumer insights, and operations management. Throughout her career, Shirley has partnered with multinational corporations to develop and execute growth strategies that address the complexities of expanding in China. She has also contributed to strategic initiatives for top Chinese beverage companies, O2O platforms, and duty-free retailers, focusing on areas such as category growth, operational transformation, and procurement optimization. Shirley holds a Bachelor of Business Administration in Global Supply Chain Management from Hong Kong Polytechnic University.

Lessons from China's consumer giants give multinational companies solutions for global growth

Chinese consumer brands are no longer playing supporting roles on the global stage — they are rewriting the script entirely. In less than a decade, homegrown players have evolved from fast followers into innovators, setting new competitive benchmarks from electronics and beauty to fashion and coffee. What was once a market defined by multinational (MNC) incumbents is now an arena where Chinese brands dominate headlines and, increasingly, market share.

Recent moves illustrate this transformation vividly. Luckin Coffee's splashy debut in New York City brought China's café culture to the heart of Manhattan, challenging established players on their home turf. Meanwhile, JD.com's planned acquisition of CECONOMY, a leading European electronics retailer, underscores just how far Chinese ambitions now extend.

These are hardly isolated wins. Take Tineco, for example, which has become the top seller on Amazon across nine overseas markets with its premium floor scrubbers, redefining the vacuum cleaning category. Similarly, Ecovacs dominates the robotic cleaning space, securing an 84% market share in Germany and over 40% in Australia and Southeast Asia. In home and garden, Segway-Ninebot's robotic lawnmowers are gaining rapid traction, now commanding around 25% of Amazon's market share.

These are not one-off success stories but part of a broader structural shift in global competition. For MNCs, the stakes are rapidly intensifying. The rise of Chinese brands overseas demands a deeper question: how do global players compete against rivals that combine manufacturing power, consumer insight, marketing precision and breathtaking speed?

▲ Cleaning up the competition

Four capabilities define the competitive edge of Chinese brands

Chinese brands have not succeeded by chance or through a single strategy. Their rise reflects the deliberate mastery of four interconnected capabilities: upstream efficiency, consumer scale, agile innovation and advanced channels. Together, these form a playbook that global competitors must now contend with and adapt to their own advantage. China's reputation as the world's factory is well established, but the reality today is more complex. The country contributes 60-70% of global production capacity for consumer appliances and electronics, supported by a dense ecosystem of highly capable original equipment manufacturers (OEMs). This capacity isn't just about scale, rather, it enables brands to achieve a level of flexibility and speed that MNCs often struggle to match.

▲ Unmatched efficiency

China's manufacturing ecosystem enables unmatched speed and scale

China's manufacturing advantage goes beyond cost arbitrage. A mature OEM network — including leaders like Huaqin, AOC, Wingtech, Snowly, Donlim and Little Swan — provides brands with unparalleled production capabilities across categories like air treatment, televisions, mobile devices, refrigeration and small appliances. This dense ecosystem enables rapid iteration, taking products from concept to market in just four to six months, far faster than the multiyear cycles typical elsewhere. By vertically integrating supplier relationships and leveraging advanced production hubs, brands achieve cost efficiencies without compromising quality, making premium positioning globally viable.

A vast middle class is driving innovation and premium positioning

The rise of China's 400 million-strong middle class — equivalent to around 90% of the EU's population — provides a testing ground for consumer-centric innovation. These consumers are increasingly value sensitive ("I pay for what matters to me"), quality driven ("quality is king"), and emotionally attached ("I choose what resonates with me emotionally, not just materially"). This evolving demand dynamic allows brands to refine premium propositions domestically before scaling them internationally. The size and sophistication of this consumer base underpin the global competitiveness of Chinese brands, allowing them to launch internationally with already-validated products and consumer insights.

Innovation is key to driving new demand worldwide

By leveraging integrated supply chains, rapid prototyping and real-time consumer feedback, Chinese brands are able to drive agile innovation and bring premium products to consumers around the world. Innovation fuels new demand and is a key factor behind the popularity of Chinese brands in global markets. Petkit's self-cleaning litter boxes hold the top market share in Japan, South Korea, Thailand and Vietnam. Notably, 77% of revenue from this product comes from overseas markets. DJI has meanwhile become a global powerhouse in camera drones, commanding an 85% market share worldwide and generating 80% of its revenue internationally. By combining rapid iteration with sharp consumer insights, these brands have turned innovation into sustained global leadership.

New digital channels are redefining how products are discovered and sold

China's brands are also rewriting the rules of global e-commerce. While established platforms like Taobao, Tmall and JD.com continue to dominate domestically, growth is increasingly driven by value-focused and socially integrated channels. Platforms such as Pinduoduo, Douyin and Red Note illustrate the shift that is now disrupting the global competitive landscape. The most striking example of Chinese players bringing their e-commerce expertise to overseas markets is Temu, which has the same parent company as Pinduoduo. As of the second quarter of 2025, Temu has surpassed Amazon in monthly active users (416.5 million versus approximately 310 million), and is projected to reach an estimated US$50 billion in gross merchandise value for 2024.

Meanwhile, these emerging platforms are becoming powerful engines for content-driven commerce, seamlessly blending entertainment, social influence and shopping into a single experience. Brands that master these ecosystems — by combining cross-channel orchestration, product-centric storytelling, and integrated content operations — are gaining direct control over consumer relationships and redefining how products are discovered and sold globally.

Global brands can accelerate growth by leveraging China

Beyond reshaping domestic brands' fortunes, the rise of Chinese capabilities is enabling international players to accelerate their own global growth. US-based SharkNinja's Shark IQ robot vacuum exemplifies how MNCs can tap into China's consumer insights, technical expertise and manufacturing scale to win in international markets.

The Shark IQ series began with a clear consumer need: SharkNinja identified a strong demand for vacuum cleaners that could avoid obstacles after analyzing US social media and customer feedback. To meet this need, it partnered with China's leading algorithm company QfeelTech, integrating advanced obstacle-avoidance technology optimized for the complex layouts of Chinese households.

Next, SharkNinja leveraged China's rapid iteration capabilities. It collaborated with home appliance maker Joyoung to conduct small-scale prototype testing with Chinese consumers, using their detailed feedback to refine the product. Once validated, production scaled rapidly, with Joyoung's upgraded Ningbo facility delivering efficient, high-quality manufacturing at reduced costs thanks to integrated supply chains.

Once the Shark IQ was finalized, SharkNinja launched it globally using a digital-first campaign across Facebook, TikTok, YouTube and Amazon. It priced the Shark IQ at $500, 30-40% cheaper than rivals like iRobot. The result was a 27% year-over-year surge in sales of SharkNinja's cleaning products in 2020, driven largely by the new line. SharkNinja's model reveals a powerful win-win blueprint: international brands can harness China's consumer scale, R&D ecosystem and production efficiency, not only to serve local markets, but to seed innovation for global expansion.

Two key actions for global brands

China has evolved into the world's most sophisticated battleground for consumer goods, and global brands can learn from its playbook. Moreover, global brands can leverage capabilities nurtured in the Chinese market to accelerate growth worldwide, as demonstrated by the SharkNinja example. To seize future growth opportunities, global brands should focus on two key actions:

Test and launch products quickly to stay ahead. China's massive consumer base, efficient manufacturing networks, and mature direct-to-consumer (DTC) channels make it an ideal environment for rapid product experimentation. International brands can leverage these advantages to prototype, validate and refine products quickly, reaching market readiness far faster than traditional timelines allow.

Export China-built know-how globally. Many MNC brands have successfully adapted to China's unique DTC ecosystem, developing innovative operating models on emerging e-commerce platforms such as Douyin and Red Note. The capabilities honed in China — such as integrated content and commerce operations, product-centric communication and consumer engagement models — have proven transferable to global channels like TikTok. To capitalize on this, global brands should actively invest in these new capabilities and systematically deploy these best practices worldwide. Done effectively, this approach can stimulate consumer demand and unlock growth at scale.

China is a unique market. While the "In China, for China" mantra once dominated strategies, MNCs are increasingly recognizing the potential of "in China, for the world" given the rise of Chinese brands overseas. Insights and lessons from the Chinese market have already been successfully applied to global markets. For MNCs operating in China, it is crucial to export these capabilities and expertise effectively. Meanwhile, other global brands can learn from China's playbook and leverage content-driven engagement to build stronger connections with consumers. I

▼ Chinese goods on their way to dominate overseas

THE TOTAL PACKAGE

Q&A

Unboxing a Sustainable Future

Interviewed by Richard Brubaker

Richard Brubaker is Managing Director, Collective Responsibility, and Founder & Executive Volunteer, HandsOn China. He has spent the last 20 years in Asia working to engage, inspire and equip those around him to take their first step toward sustainability. To date, he has overseen the development and execution of more than 250 projects focused on solving social, environmental and economic challenges. He holds a Master's in International Management from the Thunderbird School of Global Management, and serves as the Chairman of the Sustainability and Corporate Social Responsibility Committee of the American Chamber of Commerce in Shanghai.

Li Xin is President of Sustenture, a Shanghai-based strategic advisory firm for market development, investment and M&A, and Partner of Pacific Insights that specializes in packaging and sustainability. Previously, he was the China President for Sealed Air Corporation, a US multinational company in food and protective packaging. Li held sales, marketing and management responsibilities in the US and Canada for 13 years prior to his China assignment. He was appointed by the China Standardization Commission on the drafting committee for global and country standards for packaging sustainability. He was co-recipient of the 2019 World Star Award by the World Packaging Organization. Li is active with nonprofits, and serves as Chair of the Food, Agriculture & Beverage Committee at the American Chamber of Commerce in Shanghai.

Alex Xie is the Asia Strategic Program Director at AptarGroup, a global leader in drug and consumer product dosing, dispensing, and protection technologies with a global presence and over 13,000 employees across 20 countries. Before joining Aptar, Alex worked at IDEO, a global design and innovation company renowned for its design thinking methodology. In 2011, Alex founded MBA BIBLES, which is dedicated to connecting and inspiring MBA students and business leaders, and built it into one of the most influential business networking and career development platforms in Shanghai. He holds an MBA and a Master of Engineering from Shanghai Jiao Tong University's China Leaders for Global Operations Program.

Mirko Turrina is the General Manager and Vice Chairman of the board of Goglio (Tianjin) Packaging Co., Ltd, the manufacturing and commercial hub of Goglio Group for Asian market. He has been in China since 2004, serving in different roles in the aluminum industry with a focus on automotive, aerospace and high-speed train equipment. He has an MBA from the Hong Kong University of Science and Technology, a bachelor's in Mechanical Engineering from Padua University, and a certificate in Business Sustainability Management from the University of Cambridge. Besides Goglio Tianjin, he is vice-chairman of Yibai Huizhou, chief representative of Fres-co Japan, board member of I.S.T. International school, and the chair of the European Union Chamber of Commerce in China's Tianjin Chapter, which hosts the chamber's annual national carbon neutrality forum.

At a time when geopolitical tensions are straining the ties between China and the West, the urgency of addressing global challenges like climate change remains. Sustainable packaging is one area where the need for cooperation is especially vital. While innovation is advancing rapidly, systemic solutions require scale, shared expertise and cross-border collaboration.

This article gathers perspectives from three leading experts in packaging, each with deep experience in sustainability and in bridging markets across Asia, Europe and North America. Their insights highlight the technological and policy shifts driving sustainable packaging, as well as opportunities for joint progress — whether through shared supply chains, co-developed technologies or common standards.

For foreign executives navigating the

complexities of operating in China, these conversations underscore a critical message: collaboration is not just desirable but necessary. Combining Western advances in design and regulation with China's scale, speed and manufacturing capabilities can help the global packaging sector accelerate innovation, reduce waste and deliver solutions that are both commercially viable and environmentally essential.

How would you describe the current state of sustainable packaging globally? What trends, technologies or business models stand out?

Li Xin: I was impressed by the progress in sustainability and innovation from the companies I recently met with in Europe, the US and China. Plastics continue to have an important role in the world, and sustainability is driving new formulations and applications. In the plastic films category, for example, brand owners are replacing multi-layer laminated plastics with mono-material films.

Reducing the use of plastic packaging, especially single-use plastics, has become a clear mandate. Molded fiber has progressed significantly since its early use in egg cartons, becoming more sophisticated in appearance and functionality. With increasing adoption driving economies of scale as well as improvements in the manufacturing process, molded pulp has become more affordable. Recent developments in dry molded fiber technology further boosts sustainability by reducing water usage and waste discharge from the manufacturing process. There's also tremendous ingenuity with new packaging designs to reduce material, storage space and shipping volume — all important for overall emissions and solid waste reduction. All in all, I'm encouraged by the packaging industry's commitment and tangible achievements in sustainability.

Alex Xie: There is growing global awareness of and regulatory pressure on sustainable packaging. Consumers are paying greater attention to the environmental impact of packaging, while governments worldwide are introducing policies and regulations to drive its development. For example, in Europe, the Packaging and Packaging Waste Regulation (PPWR) — set to take effect by 2025 — will impose stringent measures to reduce packaging waste and boost sustainability. It will also significantly impact countries that export to Europe, pushing them to adopt more sustainable packaging practices.

Material innovation is a prominent trend in sustainable packaging. For instance, the standard pump dispensing systems used in the cosmetics industry rely on complex technology with multiple components (including metal), which inevitably complicates recycling. In contrast, the Future Pump developed by Aptar is made entirely of polyethylene (PE), enabling full recyclability. This disruptive innovation aligns perfectly with Aptar's strategy centered on circular economy solutions as well as with broader sustainable packaging trends.

Who's driving this change for sustainability?

Li Xin: Sustainability is now a core driver for all major stakeholders. Globally, consumer campaigns for sustainability like "Plastic Free July" are gaining momentum, while European regulators are enforcing change through policies such as the PPWR, Extended Producer Responsibility (EPR) and the Single-Use Plastics Directive. In the US, major brands and industry alliances have taken resolute actions for sustainable packaging. Apple has led the way, reducing its plastic product packaging to only 3% for all products shipped in 2023. Amazon is another example, having replaced 95% of its plastic air pillows with paper filler in North America by mid-2024. This year, it has ventured further into sustainable packaging by investing in a paper packaging company. This, in turn, has motivated packaging producers to double down on fiber packaging, and plastic-centric companies to become "substrate agnostic" in consumer-facing end markets like e-commerce. In China, the government is integrating sustainability into its industrial policy through its carbon-neutral targets and pushing industries to adopt green packaging as part of its broader carbon-neutrality goals

How do you see sustainability goals shaping packaging innovation in the West over the next three to five years?

Li Xin: Withdrawals from the Paris Agreement and several major companies exiting the US Plastics Pact have sent mixed messages in terms of sustainability commitments. These setbacks also highlight that sustainability must be balanced with economic viability and execution reality; such factors will be necessary considerations for packaging innovation in the coming years. Nevertheless, the broader momentum remains strong. New members are still joining the Plastics Pact, and global efforts, such as the UN Environment Programme's negotiations are for plastics

▲ Molded pulp packaging

▲ Honeycomb packaging

management and circular economy, are advancing. The sustainability train has long left the station, and the trend is irreversible.

Alex Xie: Many large multinationals (MNCs) — especially Western fast-moving consumer goods (FMCG) companies — have established specific sustainable packaging targets. In turn, packaging companies are treating sustainability as a key competitive advantage, driving continued investment in packaging innovation. Their commitment is formalized by publishing annual sustainability reports in accordance with Global Reporting Initiative (GRI) standards, which detail progress toward the UN Sustainable Development Goals (SDGs). Some even include a supplementary overview aligned with Sustainability Accounting Standards Board (SASB) standards in their reports. I believe more companies will join this journey in the coming years.

Mirko Turrina: Over the next three to five years, sustainability goals will profoundly shape packaging innovation in the West, though the path remains complex. A major driver will be the growing demand for transparency. As consumer skepticism of greenwashing increases, brands will need to provide verifiable proof for their environmental claims. This shift means that traceability and sustainability credentials will become crucial for maintaining consumer trust.

Technologically, we're seeing promising advances in areas like chemical recycling — particularly for complex materials such as aluminum-based barrier packaging, which is widely used for oxygen-sensitive products but difficult to recycle conventionally. New technologies are emerging that can separate aluminum from polyolefin layers, recovering valuable materials like aluminum and oil that can be reused in plastic production.

The real challenge, however, isn't material innovation; it's building economically viable systems for collection, processing and regeneration, especially for flexible packaging. While significant public and private funding is flowing into recycling infrastructure, a full circular solution remains uncertain in the short term. As a packaging specialist, Goglio will continue developing adaptable, market-ready solutions — from mono-material recyclable structures to advanced recycling-compatible designs — to ensure we meet both sustainability aims and functional requirements.

▲ Pack Expo in Las Vegas, October 2025

What does the landscape of sustainable packaging look like in China today?

Li Xin: In the foodservice sector, legislation has mandated replacing plastic straws, cups, plates and bowls with paper and bio-plastic plastic alternatives. In the industrial and distribution packaging sector, sustainability focuses on increasing recycled content, light-weighting and down-gauging, and designs that use the least amount of material while ensuring adequate protection. This drive is motivated by economic viability as much as environmental sustainability.

Alex Xie: The landscape of sustainable packaging in China today is dynamic and rapidly evolving, driven by robust policy support, shifting market demands, and ongoing innovation. In terms of policy and regulation, China has outlined its dual goals of peaking carbon emissions before 2030 and achieving carbon neutrality before 2060. Guided by these objectives, a growing number of companies and consumers in China are embracing the concept of sustainable packaging.

Additionally, the related market in China is witnessing significant growth—with the sustainable packaging materials sector alone projected to exceed $25 billion by 2025.

Mirko Turrina: China's sustainable packaging sector is transforming at an unprecedented pace. The government's "dual carbon" roadmap has progressed from vision to concrete action. For instance, as a Tianjin Green Factory and Digital Workshop, we power our operations sustainably, sourcing 13.1% of our electricity from on-site photovoltaic generation in 2024. Simultaneously, e-commerce giants are driving innovation, already achieving significantly reductions in express packaging weight. This showcases China's distinct advantage: an unmatched speed of execution.

Are there particular technologies, approaches, or innovators in China that you think are underappreciated by Western audiences?

Li Xin: Sometimes, the most innovative solutions emerge when ancient wisdom meets modern technology. Plant fiber packaging, a concept dating back to pulped paper invented during China's Han dynasty 2,000 years ago, is making global comeback for packaging. It is now widely used in the consumer goods and electronics manufacturing sector, where it packages products from smartphones and computers to spirit bottles and auto parts.

Similarly, the honeycomb, one of nature's strongest structures, has also been reengineered into lightweight paper cushions, mailers and rigid boxes, all of which are recyclable curbside. This innovation can replace a range of plastic foams. It's fascinating to see these ancient materials and structures gain new life, often through new proprietary patents from Chinese businesses and universities.

Alex Xie: Many Chinese startups are innovators and playing an important role that I believe is underappreciated by Western audiences. For example, at Aptar, we invested in Yan An Tang (YAT), a startup in the cosmetics industry. YAT launched a cosmetic packaging recycling program whereby users can place an order, and a delivery person will collect their empty cosmetic packaging for free. In return, they receive coupons and discounts for new products. By leveraging the entire recycling ecosystem and e-commerce infrastructure, YAT can focus on its core capabilities and scale its services. Based on the lessons and experience from this service to end consumers, right now YAT also provides SaaS services to other cosmetics brands to help them do packaging recycling operations.

Mirko Turrina: There are several technologies and approaches emerging from China that deserve more attention from the West, particularly smart reverse logistics, agricultural waste upcycling and hyper-localized recycling. Goglio is implementing some innovations. For example, we've developed advanced decoration and printing techniques that allow us to integrate aesthetic appeal with sustainability, such as laser and anti-counterfeiting effects on the surface of packaging, and unique QR codes on both the interior and exterior of pre-made pouches. This not only enhances functionality and consumer engagement but also minimizes environmental impact without sacrificing quality or visual appeal.

What makes China stand out is its ability to deliver such sophisticated packaging solutions cost-effectively. The scale of the market, coupled with highly adaptive suppliers and mature supply chains, allows for innovations that are both technically advanced and economically viable. The latter factor can help greatly accelerate the global adoption of sustainable packaging.

What do leaders in the EU and US need to know about how China is approaching innovation in packaging?

Li Xin: Western businesses may be surprised by the rapid implementation of Industry 4.0 in China's manufacturing sector, which includes packaging. The integration of AI is creating smarter, fully automated processes that enhance speed and precision, quality consistency and traceability. A prime example is Chinese appliance giant Midea. Its 2014 acquisition of KUKA/Swisslog marked a strategic move into robotics for smart factory and material handling. In July 2025, Midea's opening of a Shanghai innovation center to advance smart manufacturing and supply chain operations (essential for high stock keeping unit distribution operations), including sorting, packaging and distribution — exemplified this ongoing commitment.

Companies like Midea are compelling downstream packaging equipment suppliers to upgrade and integrate. Packaging equipment manufacturers are introducing AI-powered "pick & pack" packaging robots, which use visual sensing to select orders and place them straight into shipping boxes. Such robots have been shown in Europe and the US, including the Pack Expo in Las Vegas.

Alex Xie: Chinese companies leverage China's integrated supply chain and large market to drive rapid innovation in packaging, enabling them to provide cost-effective packaging solutions. For instance, they are highly competitive in the beauty and cosmetics packaging industry — with some even exporting sustainable packaging solutions (e.g., fully plastic pumps) to markets worldwide.

Mirko Turrina: Western leaders should recognize that China's packaging innovation stems from a fundamentally different paradigm. Here, policy mandates, digital ecosystems and manufacturing agility converge to deliver solutions at a speed and scale unimaginable elsewhere. The "China model" combines top-down targets, like the 2025 mandatory recycling rates, with bottom-up digital tools, all powered by the world's most responsive supply chains. While Western companies excel at perfecting individual innovations, China's strength lies in system-level reinvention.

Where do you see the greatest opportunities for East-West collaboration in sustainable packaging? What kinds of partnerships — across technology, supply chains or design — could be game changers if developed at scale?

Li Xin: Global collaboration is essential to transform agricultural waste into valuable packaging materials. Although fiber-based packaging is on the rise, much of the pulp still comes from forestry. Converting agricultural byproducts like wheat/rice straws, corn stalks, bagasse and bamboo into high-functionality paper remains technically and economically challenging. This challenge presents a strong business opportunity: developing and scaling efficient processing technologies, including specialized machinery, cleaner production methods and water-saving techniques, for agricultural waste-based paper.

▲ Out with the old

Alex Xie: Win-win outcomes and commercial viability are the two core principles of successful cross-border collaboration. Packaging innovation, especially in new sustainable materials, will be one of the greatest opportunities for East-West collaboration. China has a comprehensive packaging supply chain and ecosystem, covering packaging materials, manufacturing, automation, assembly, and more. In the beauty and cosmetics industry, many European and American companies are collaborating with Chinese packaging suppliers and achieving considerable success in the market.

Mirko Turrina: What excites me most are the tangible opportunities where East-West collaboration creates entirely new solutions. Take advanced recycling, where we can combine European chemical recycling breakthroughs with China's manufacturing speed. Or digital circularity, where we can pair Europe's digital watermarking with China's mobile payment ecosystems. The future isn't about any single region's technology but about creating "innovation bridges" that leverage complementary strengths. By integrating China's efficient production into the global supply chain, we can significantly reduce inefficiencies and overall environmental impact. China offers strong, large-scale manufacturing capabilities — particularly for base materials and high-quality laminates or foils — at low cost and reliable quality. Meanwhile, customization and market adaptation are often best handled closer to the end-consumer in the West.

Three strategic partnerships could revolutionize sustainable packaging at scale: First, cross-border technology consortia combining Western R&D with Chinese production capabilities to commercialize next-generation materials like bio-based barriers at competitive costs. Second, integrated supply chain alliances that connect global brand owners with regional material recovery facilities. Third, digital-physical design collaborations leveraging China's manufacturing data and Western simulation tools to accelerate development cycles. The game-changer lies in moving beyond transactional relationships to create interconnected ecosystems where material innovators, converters, brands and recyclers co-develop solutions.

What are the most common barriers to global collaboration in sustainable packaging? How can companies or industries start to overcome them?

Li Xin: A differing approach to innovation — prioritizing speed to market over functional perfection — defines the cultural differences between Chinese and Western business cultures, particularly in packaging machinery. When it comes to packaging machinery, Western manufacturers pride themselves on high-throughput, quality machines that are built to last. For R&D of new materials and equipment, MNCs have a stage-gate process to dot their i's and cross their t's, and perfection takes time. Chinese entrepreneurs, conversely, champion a "good enough" philosophy, rapidly iterating based on market feedback and adding functions on an as-needed basis. This approach is often misconstrued as inadequate or even inferior. But China has proven its capacity for excellence when mandated, as seen in its electric vehicle industry, for example, building quality cars that meet global safety standards. By working with their Western counterparts and customers, Chinese companies can meet the highest standards in quality and safety for packaging machinery.

Concerns regarding IP infringement are a legitimate concern, though they are increasingly manageable. Such issues can be managed without compromising well-structured collaborations or hindering business development. As China transitions into an innovation economy, it is also strengthening its enforcement of IP rights. MNCs like Starbucks, Ferrero, Autodesk, Lifetime Products and Zespri have successfully won court cases against counterfeiters in China. They are managing their IP through a multi-pronged strategy: establishing a stakeholders' alliance that includes local licensees and distributors, engaging governmental and public relations channels to deter violators, and pursuing legal action to protect their rights effectively.

Alex Xie: The two most common barriers to global collaboration in sustainable packaging are geopolitical tensions and challenges to commercial viability. For example, tariff issues have made some collaborations no longer commercially sustainable. For multinational companies, pursuing greater localization in innovation and supply chains is advisable. Additionally, more technical collaboration should be fostered across the entire value chain.

Mirko Turrina: The challenges hindering global collaboration are as layered as the multi-material packaging we're trying to replace. While technical hurdles exist — particularly around standardizing recycling protocols across regions — the most persistent barriers stem from misaligned incentives and fragmented systems. Commercial priorities often clash, with Western partners seeking premium sustainability solutions while Asian markets demand ultra-cost-sensitive options. Culturally, we still face a "not invented here" mindset that undervalues complementary strengths, like when European designers dismiss Asia's rapid prototyping capabilities as "just manufacturing." Politically, fluctuating trade policies create uncertainty that stifles long-term R&D investments. Perhaps the most overlooked gap is data sovereignty concerns that prevent the seamless information sharing required for circular systems.

Breaking down these barriers requires a fundamentally new approach to collaboration that moves beyond traditional buyer-supplier relationships. We've seen success with three concrete strategies: First, establishing pre-competitive innovation consortia where competitors jointly fund basic research while preserving commercial differentiation. Second, creating "collaboration playbooks" that align expectations upfront. Third, piloting small-scale "proof of concept" projects before scaling. Trust gets built kilogram by kilogram, not through MOUs but by actually moving materials through shared circular systems. Companies that make these mindset shifts will discover that today's operational challenges become tomorrow's competitive advantages.

What does a truly global approach to sustainable packaging look like to you? What steps should companies take to move in that direction?

Li Xin: Sustainability is a global issue, and innovative solutions can come from anywhere. A truly global approach will be one of collaboration with complementary strengths and producing economically sustainable businesses for all parties. Leaders who have done well collaborating for innovation have been rewarded by business growth from customers who demand sustainable solutions. Here are a few of these leaders' best practices:

1. Take a holistic approach when evaluating a packaging innovation, rather than in silos of substrate, machine, application and then maybe commercial. The full picture better presents the solution's business value and customer benefits, beyond its technical and sustainability attributes.
2. "Make vs buy." Corporations have a wealth of R&D talents, but in-house inventions ("make") take time and effort. When challenged by economic viability or meeting deadlines, I would suggest collaborating with partners with diverse expertise — contract design, cost innovation, licensing IP, or acquisition ("buy") — to speed up the effort, rather than moving the goalpost.
3. Lead the market with innovation that offers something different. Past innovations like suspension packaging, inflatable

pouches, expandable foams and paper cushions were all different in style and in form, but they've each carved out a unique market niche through superior product protection. When evaluating a novel material, ask a business question, for example: "Is this molded pulp 'good enough' to replace a sizable portion of its plastic incumbent?" If the answer is yes, then take a bold step to lead the transformation with determination and agility; hesitation only cedes the advantage to competitors.

Alex Xie: A truly global approach to sustainable packaging should embrace a holistic system that considers two lenses: the entire lifecycle lens and the entire value chain lens. When considering the entire lifecycle of packaging, companies should think about everything from packaging design to its end-of-life, aligning with global standards while adapting to local realities in different countries. When considering the entire value chain of packaging, companies should collaborate with various stakeholders and partners, including governments, associations, suppliers, consumers and more. Adopting these two lenses requires committed, structured plans. Companies should consider the following steps:

- Treat sustainable packaging as one of their top strategic priorities
- Set measurable, transparent and achievable goals
- Allocate resources — for example, investing in innovation and talent
- Foster deep collaboration with stakeholders across the entire value chain

There is no one-size-fits-all standard for sustainable packaging. Regulations, industry practices, and consumer preferences often vary significantly from country to country. Companies, especially multinational ones, should tailor strategies to local markets and ensure their "global" approach is adaptable.

Mirko Turrina: A truly global approach to sustainable packaging should be built on a transparent, full-lifecycle carbon footprint assessment — from origin to end-of-life, or what I describe as "from Kyoto to Tokyo, and back to Kyoto." This ensures an objective and unbiased evaluation. Often-overlooked factors like the emissions generated by food waste resulting from inadequate packaging will be critical to this assessment.

Companies should begin by mapping their entire supply chain to accurately understand their carbon footprint. This isn't a challenge that can be tackled alone. It requires collaboration with all stakeholders: suppliers, customers, industry associations and experts. For instance, in China, we were one of the first members of the Green Recycling Plastics Supply Chain Group. Working together is essential to driving systemic change. I

War Heroes
Remembering the Flying Tigers

▲ A flying Tiger in a Curtiss P-40 with the signature shark insignia

The Flying Tigers, officially known as the American Volunteer Group (AVG), were a unit of volunteer pilots and ground crews recruited from the United States in 1941 to aid China in its struggle against Japanese aggression during World War II.

Under the leadership of General Claire Lee Chennault — who had been invited to China in 1937 to serve as an Air Force adviser — the group was organized into three squadrons equipped with Curtiss P-40 fighter planes, which were adorned with shark-faced nose art.

Before America's formal entry into the war, the Flying Tigers were already actively training to defend Chinese cities and China's crucial "Burma Road"supply route. On December 20, 1941, less than two weeks after Japan's surprise attack on the American naval base at Pearl Harbor, they achieved their first combat victory by directly shooting down four Japanese Ki-48 bombers and severely damaging six more that were preparing to attack the Chinese city of Kunming. Over the next seven months, the Flying Tigers earned an extraordinary reputation. Official records credit them with destroying nearly 300 Japanese aircraft, while sustaining minimal losses of their own.

The group's success was not only due to their skilled pilots,

▲ "Adam and Eve" squadron

▲ "Hell's Angels" squadron

▲ A fighter next to a P-40 with a logo created by the Walt Disney Company

▲ "Panda Bears" squadron

▲ Team members inspecting the rudder of a downed Japanese Nakajima Type 97 fighter

but also to innovative tactics developed by Chennault, including "dive-and-zoom" attacks that maximized the P-40's strengths against the formidable Japanese planes.

In July 1942, the AVG was disbanded and absorbed into the US Army Air Forces as the China Air Task Force (CATF), continuing its mission under Chennault's command. The CATF was disbanded the following spring and replaced by a larger and more capable 14th Air Force, which Chennault led until his retirement in 1945.

The Flying Tigers left a lasting legacy as symbols of US-China cooperation and remain celebrated in both countries as legendary heroes of the air. The Sino-American Aviation Heritage Foundation was established in 1998 by Flying Tigers veterans and their family members, dedicated to promoting US-China friendship by preserving the group's legacy.

To mark the 80th anniversary of the end of the Second World War, the foundation organized the "Remembering Heroes: The Flying Tigers Historical Photo Exhibition" as a touring exhibition in several cities to showcase historic photos and artifacts of "Flying Tiger" veterans. AmCham Shanghai, with the sponsorship of member company Marriott International, participated in the opening ceremonies for the exhibit in Shanghai and Fuzhou.

All photos in this article are courtesy of the foundation. I

▲ American Volunteer Group pilots run towards their aircraft at Kunming Wujiaba Airfield, preparing for combat.

▲ Ground crew unloading a damaged Hawk 81A-2 Tomahawk fighter that was damaged in combat

Interviewed by Rachel Rapaport

Q&A

China's Biopharma Boom

Avantor in Action

Janny Wang is Vice President and General Manager of China for Avantor. She brings more than 20 years of comprehensive experience in leading cross-functional teams including accounts, product, sales and business management in the Chinese life science and pharmaceutical industry. In her current role, she drives all commercial and operational management in Greater China and delivers Avantor's strategy to significantly grow its Greater China revenue, manufacturing footprint and team in size and quality. She is accountable for managing the development and execution of life sciences-focused "in China for China" and "in China for APAC" manufacturing strategy. Prior to joining Avantor, Janny served as Head of Biomonitoring, Asia Pacific at a famous life science company. She also held various leadership positions there including General Manager and Head of Process Solutions, China. She has an Executive Master of Business Administration from the China Europe International Business School.

Tell us about your career journey. How did you get started in this field?

After graduating with a degree in pharmaceutical engineering, I joined Millipore, a life sciences company headquartered in Massachusetts. My career was very vertical. I started in sales and was promoted several times in different sales roles from regional sales manager to senior manager, and so on. In 2010, Millipore was acquired by Merck KGaA. In 2016, I became the general manager of Process Solutions. I led that division for three years and tripled the China business. After that, I was promoted to APAC head of Biomonitoring. I changed jobs for the first time in 2021 — a big step after almost 18 years at the same company.

Avantor moved its China headquarters to Pudong in 2024. Can you walk us through the company's history in China?

Avantor was founded in 1867, so it now has more than 150 years of history. Globally, Avantor has over 13,000 employees operations in more than 30 countries, and more than 200 production, distribution, service, R&D and sales centers serving 300,000 customers across 180 countries. In 2016, we acquired an American company called Nu-Sil, and we acquired VWR, a well-known life sciences company, in 2017. We re-listed on the New York Stock Exchange in 2019 and ranked on the Fortune 500 list in 2020.

We entered China in 2009, which is relatively late compared to other multinational companies (MNCs) in this industry that have been here for over a hundred years. In 2021, we acquired Changzhou RIM Bio, a manufacturer of single-use products. This was also when I joined Avantor. That same year, we globally acquired a brand called Masterflex which strengthened our ability to integrate Avantor's fluid handling product portfolio. In August 2024, our China headquarters officially opened in the New Bund, Pudong.

What are Avantor's main product offerings in China?

Avantor Life Sciences operates in China through two core business units, supported by additional specialized segments. The Biopharma Production Solutions unit provides comprehensive product portfolios for the entire biopharmaceutical manufacturing process from upstream to downstream. Our offerings include pharmaceutical excipients, single-use systems, fluid-handling solutions, chromatography resins, and cleanroom controlled solutions (CCS). Through cross-functional collaboration, we deliver tailored products and solutions that address cost pressures, enhance supply chain efficiency, meet regulatory standards, and accelerate drug development to bring life-saving treatments to market faster.

The Lab and Sciences Solutions (LSS) unit supports the entire laboratory lifecycle through renowned brands including VWR, J.T.Baker, and amresco. It supplies R&D and quality control labs with reagents, consumables, instruments, solvents and chromatography columns. Beyond products, LSS offers value-added services like lab management, procurement and EHS support.

In addition to the two primary units, Avantor's biomaterials and advanced technologies business delivers high-performance custom materials, including NuSil medical and aerospace silicones for extreme environments and J.T.Baker ultra-pure products for semiconductors. These products enable innovation, ensure reliability and provide expert technical support across healthcare, aerospace, electronics and other critical industries.

Tell us about the Shanghai Innovation and Customer Support Center. How does Avantor approach innovation within the China market, particularly in response to evolving regulations and customer needs? What role does the center play in Avantor's global R&D and customer engagement efforts?

We position our innovation centers as pharmaceutical innovation accelerators for China under the core philosophy of "co-develop and co-grow." That means opening up technical expertise, localizing responsiveness, fostering ecosystem collaboration, and leveraging Avantor's global capabilities to deliver solutions that are both compliant and adapted to the Chinese market. Our goal is to empower domestic pharmaceutical companies to reduce costs, accelerate timelines, ensure regulatory compliance, and most importantly, receive process development support. So far, we have supported more than 300 clients and completed over 60 commercial projects across a wide range of segments, including recombinant proteins, monoclonal antibodies, antibody–drug conjugates (ADC) and cell and gene therapy.

What does "In China, for China" mean to Avantor in practice? How localized is Avantor's supply chain, and has that changed due to external disruptions or policy shifts?

The market situation is very different now compared to before Covid. We have rooted our strategy in local market demands and want to accelerate growth. That's why last year we reshaped China strategy: empowering local resources with global quality system to better serve China market.

When we talk about localization, it's not just about setting up manufacturing sites in China. We also aim to leverage local resources comprehensively — from raw material, manufacturing, and talent. The most important principle is maintaining quality, so our China strategy is fully implemented under Avantor's global quality systems. For example, in China we have two exclusive brands serving this market: RIM and amresco. Our goal is to integrate a premium local supply chain with Avantor's global quality systems to deliver high quality, competitive pricing, rapid delivery and agile management. Recently, we launched high-purity solvents, biological reagents, and more than 20 types of RIM single-use consumables in China. Based on the current market landscape and regulatory environment, our China strategy will ultimately be to operate a fully localized supply chain under global quality standards—truly "local for local."

China's biotech industry is booming, with major deals between multinational pharmaceutical companies and local innovators in what some call a "DeepSeek moment." How is Avantor supporting this industry expansion?

As I mentioned, both types of customers — MNCs and domestic companies — are critical for us. Pharmaceutical MNCs continue to invest heavily in China. We want to ensure we provide the same high-quality services to them here as we do globally.

Domestic pharmaceutical companies in China have shown very strong capabilities. Before Covid, the life sciences, pharmaceutical equipment and consumables market was mainly dominated by MNCs but since Covid, local companies have significantly developed their technologies and quality capabilities so the competitive landscape is very different. MNCs have lost much of the lower-tier market to local companies, though for some critical applications, MNCs still retain the lead. If you look at global new molecule pipelines, nearly 30% are from China. These new molecules represent the future of the pharmaceutical market, which makes domestic customers just as critical for our business.

Many Chinese companies are not only targeting the local market but also aiming to expand overseas. We understand their needs in areas such as pharmacopeia and specific regulatory requirements from raw material, manufacturing and quality sys-

tems so we can better serve them. Pharmaceuticals is a highly regulated industry, and as an MNC, we understand the regulatory requirements both for local and international markets. This enables us to provide better support to Chinese companies seeking to enter overseas markets.

Avantor is continuously increasing its local investments to address China-specific needs, delivering cost-effective, quality-assured products with rapid response and providing full lifecycle support for client operations. This July, amresco launched dozens of new high-purity solvents, biochemical reagents and biological reagents, while RIM has launched more than 20 new single-use products for China.

> "Working together allows us to address global medical and human health needs more effectively. US-China collaboration in biopharma means saving lives together."

Pharmaceuticals and life sciences is a field with highly globalized supply chains and outputs that can improve lives worldwide. As an American firm operating in China, what's your perspective on US-China collaboration in this sector?

The reality is that the US is the largest healthcare consumer market per capita and has very advanced technologies. But fundamentally, China is the primary global supplier of active pharmaceutical ingredients. Over the past decade, China has significantly improved its R&D and clinical capabilities. Its healthcare market is enormous because of its large and aging population, which makes it one of the most promising markets worldwide. The two markets are different, but there is huge potential for synergy. China has many excellent professionals in drug R&D, clinical development, as well as contract development and manufacturing. Working together would mean combining innovation with manufacturing scale. Of course, there are geopolitical uncertainties, but we hope to deepen collaboration rather than treating it as a competition. Working together allows us to address global medical and human health needs more effectively. US-China collaboration in biopharma means saving lives together.

Can you share any progress on sustainability or digital transformation initiatives within your China operations?

Last year, Avantor earned an EcoVadis Bronze medal, which places us in the top 35% globally for validating sustainable procurement and emission reduction programs. This year, our China office also won the International Gold Prize for Sustainable Habitat Design Awards. In terms of social responsibility, the Avantor Foundation has mobilized 15,000 employee volunteer hours for community initiatives. We are also deploying AI and automation across operations to enhance efficiency and precision.

Globally, we have three manufacturing sites producing single-use products. We invest heavily in green electricity and other carbon reduction measures. These efforts are costly, but important.

Where do you see the biggest opportunities and challenges as China's biopharma sector continues to evolve?

China offers massive cost efficiency (40–60% lower R&D costs) and faster patient recruitment, attracting global partnerships. Supportive policies (e.g., streamlined patent linkage) and leadership in innovative fields like ADCs and gene editing boost its global position. Rising license-out deals reflect growing international recognition and royalty-sharing models.

Yet the sector faces innovation homogeneity (overcrowded targets like PD-1), geopolitical risks (US restrictions), and pricing pressure from centralized procurement. Talent gaps in global clinical development and IP protection also remain hurdles. Balancing rapid innovation with sustainable commercialization is critical.

With continued policy support and focus on differentiated innovation, China is poised to become a global biopharma leader, though navigating geopolitics and internal competition will be essential. I

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