

Linesight's Stephanie Ledwidge on reducing delivery risk in APAC life sciences projects

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Power availability, utility infrastructure, specialist labour and long-lead equipment are increasingly shaping where and how pharmaceutical and biotechnology facilities are built across Asia-Pacific.

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Asia-Pacific continues to attract investment across pharmaceutical manufacturing, biotechnology, vaccines, advanced therapeutics and medical technology. But as the region's life sciences sector expands, decisions on where to build are increasingly being shaped by infrastructure, execution risk and the ability to bring facilities into operation on schedule.

Power availability, utility capacity, regulatory maturity, skilled labour and access to established biomanufacturing ecosystems are becoming as important as market demand or construction cost. At the same time, supply chain disruption and longer procurement timelines are forcing developers to engage suppliers and plan for critical equipment much earlier in the project lifecycle.

Stephanie Ledwidge, Associate Director, Life Sciences at Linesight, discusses how these pressures are changing life sciences site selection, project delivery and facility design across Asia-Pacific, and why modular construction and earlier risk planning are becoming more important for resilient manufacturing networks.

Asia-Pacific continues to attract significant investment in pharmaceutical manufacturing and biotechnology. Beyond market demand, what factors are now influencing where companies choose to build their next life sciences facilities?

Asia-Pacific (APAC) remains one of the world's most attractive destinations for life sciences investment. Robust capital deployment and demand for life sciences facilities is evident across pharmaceutical manufacturing, biotechnology research, advanced therapeutics, vaccine production and medical technology.

However, the regional growth story isn't completely uniform and demand is no longer the main driver for location on its own. Construction of life sciences facilities remains focused in certain markets where governments are prioritising healthcare resilience, sovereign manufacturing capability and supply chain diversification. Singapore for example, continues to strengthen its position as a biopharma and next-generation therapeutics hub, supported by research capability, manufacturing depth and public-private collaboration.

What we're also seeing across our life sciences clients is that site selection has become an infrastructure and delivery-certainty decision as much as a commercial one. Power availability is now a key consideration rather than a formality. Life sciences facilities all carry heavy, highly resilient utility loads, and grid capacity or connection timeline constraints can influence site suitability before master planning even begins.

Regulatory maturity and speed to approval are additional key considerations. Sponsors are weighing how quickly a market can move a facility from concept to GMP-ready, not just labour cost or land price.

Workforce depth is another differentiator including availability of construction labour and access to specialised trades experienced in cleanroom, high-purity utilities and validation-critical work, alongside a technical talent pool that can staff the facility once it's operating.

Increasingly, companies are prioritising locations with an established life sciences ecosystem - existing biomanufacturing clusters, supply chain proximity, and delivery partners who already understand the sector's compliance and quality expectations - because that reduces execution risk.

Singapore is a good example as it continues to strengthen its position as a biopharma and next-generation therapeutics hub, supported by research capability, manufacturing depth and public-private collaboration.

Linesight's latest Construction Market Insights Report for APAC suggests that delivery, rather than demand, has become the industry's greatest challenge. How are issues such as power availability, utility infrastructure, supply chain disruption, and labour shortages, especially in recent times, changing the way life sciences projects are planned and executed?

Linesight's latest Construction Market Insights report clearly identifies that delivery, not demand, is now the industry's central challenge in APAC. Life sciences projects feel that acutely because they have low tolerance for schedule slippage and a delayed facility can mean a delay in getting product to market and more importantly, to patients.

Power and utility availability have become key considerations much earlier in the project lifecycle. Pharmaceutical and biotechnology facilities require highly reliable power systems, sophisticated HVAC infrastructure, purified water and tightly controlled operating environments. As a result, developers are conducting utility assessments earlier and placing greater emphasis on securing power connections, substations and water infrastructure before progressing projects. In some cases, utility constraints are even influencing site selection decisions.

Supply chain disruption and material availability are prompting more strategic procurement planning across the board. Cost volatility, longer procurement timelines and logistics uncertainty - including disruption to major shipping routes and tariff exposure, have all increased delivery risk.

Long-lead equipment from cleanroom HVAC to specialised process utilities, along with power and utility infrastructure now need to be scoped and committed to at concept design, not procurement stage. Life sciences facilities are particularly exposed because they depend on specialist materials and equipment: stainless steel, cleanroom components, air handling systems, and electrical infrastructure. Long-lead equipment alone can account for 35–40% of capital expenditure on many life science projects, which is pushing clients and their delivery teams toward earlier supplier engagement, forward purchasing, more diversified sourcing, and greater transparency on where critical components originate, so risk is priced and mitigated rather than discovered mid-project.

Labour shortages are also creating further challenges. Life sciences projects need specialist expertise across design, construction, commissioning and validation such as cleanroom specialists, process engineers, and validation professionals which is already compounded by a tight skilled labour market across APAC. We're seeing more reliance on regional mobilisation of specialised trades and closer coordination across markets, rather than assuming local labour pools alone can staff complex facilities, which makes workforce planning as critical to execution as procurement or design. In addition, developers are facing intensified contractor capacity constraints, wage inflation and potential programme delays, making workforce planning a critical part of project execution.

Underpinning all of this is a move toward embedded, continuous project oversight rather than transactional, stage-by-stage engagement. When power, supply chain and labour risk can each independently derail a schedule, the value shifts to a delivery partner who holds full project memory and can flag and resolve issues before they cascade, rather than one who is reassembled at each new phase.

Pharmaceutical manufacturing facilities are becoming increasingly complex, particularly with the growth of biologics, cell and gene therapies, and advanced therapeutics. How are facility design and project delivery evolving to support these next-generation manufacturing requirements?

Facility design and delivery strategies are evolving to support the stringent requirements of biologics, cell and gene therapies, and next-generation therapeutics. These facilities depend on highly reliable power systems, sophisticated HVAC infrastructure, purified water systems, clean steam generation and tightly controlled environmental conditions, making utility planning and infrastructure resilience increasingly important.

At the same time, we are observing more proactive and risk-focused engagement on project delivery. Developers are engaging suppliers earlier, securing long-lead equipment in advance, and diversifying sourcing strategies to reduce supply chain risks and improve programme certainty. Many organisations are also adopting modular construction and Design for Manufacture and Assembly (DfMA) approaches.

Modular construction and Design for Manufacture and Assembly (DfMA) are gaining traction across the region. What advantages do these approaches offer life sciences companies, and where do you see the greatest opportunities for wider adoption across Asia-Pacific?

Modular and DfMA approaches address two key considerations for life sciences clients: schedule certainty and quality consistency. Manufacturing cleanroom modules, skids and process equipment off-site in a controlled factory environment reduces exposure to on-site labour shortages and weather-driven delays, and allows site works and module fabrication to happen in parallel rather than sequentially. This can meaningfully compress overall programme duration on facilities that often need to be operational on stringent timelines.

With delivery risk against the backdrop of sustained market volatility continuing to be a key consideration, the increased push for DfMA is also being driven by key government initiatives. For example Singapore's Ministry of National Development has prioritised DfMA as one of its core construction strategies under the BCA.

Across APAC, the greatest opportunities lie in markets where local specialised labour is constrained but manufacturing capacity for modules exists regionally. DfMA can offset skilled trade shortages by shifting complexity into a factory setting. APAC markets such as China are already some of the biggest suppliers of prefabricated modules, demonstrating the surge in demand for prefabricated facilities and buildings. The other opportunity is in multi-facility rollouts: companies establishing a manufacturing network across two or three APAC markets can standardise a modular design and replicate it, gaining speed and cost certainty on each subsequent facility rather than starting from scratch.

Looking ahead, what trends do you believe will have the greatest impact on life sciences infrastructure investment over the next five years, and how should pharmaceutical and biotechnology companies prepare to build more resilient manufacturing networks?

The long-term outlook for life sciences construction across Asia-Pacific remains favourable for the industry, underpinned by healthy demand to support significant capital investment across the region.

There are a few stand out trends:

- Power and utility infrastructure will increasingly determine site selection ahead of traditional factors like labour cost, as grid capacity becomes the binding constraint on new biomanufacturing investment across several APAC markets.
- Geographic diversification will continue, with companies building second or third APAC sites deliberately to de-risk single-country exposure, rather than concentrating capacity in one hub.
- And finally, the shift toward biologics and cell and gene therapy will keep pushing facility design toward flexible, multi-product platforms rather than dedicated single-product plants.

For pharmaceutical and biotech companies preparing to build more resilient networks, delivery risk needs to be treated as seriously as commercial risk from the outset. That means engaging utility, power and long-lead equipment planning at concept stage rather than procurement stage; building supply chain and tariff exposure into site selection criteria, not just cost per square metre; and choosing delivery partners who can provide continuity of oversight across the full project lifecycle from feasibility through to qualification so knowledge isn't lost at each phase transition. In a region where delivery, not demand, is now the primary constraint, resilience increasingly comes down to how early and how thoroughly these risks are planned for, not how quickly a project can be pushed through construction once it starts.