

Investment and wind OEM supply chain risks



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Delays present a rising risk
to projects

Move towards price
indexation in contracts

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Foreword

Delays threaten projects when there's price trouble in the supply chain. Investors and developers are making changes to contracting practices to stay ahead of the curve.

The delays are prompted by geopolitical shifts and changes in the global pricing for services and goods needed by wind turbine makers, including transportation and steel. Diesel and natural gas are also potential weak links in the vast and complex network of supplies that is called upon when making a wind turbine.

This report puts supply chain questions to experts close to the wind development and turbine manufacturing sectors in order to explain what the future could look like for wind projects in the West. It discusses whether rising European onshore wind turbine costs will remain part of the picture for the long term.



Concerns grew for Western wind project sponsors as for two years they watched turbine parts arrive late to sites and commodity prices soar.

Some European turbine OEMs have struggled to deliver. Shashi Barla, Head of Renewables Research at Danish advisory firm Brinckmann Group, explains that European turbine manufacturers balked at costly logistics during a surge of post-pandemic demand in 2021.

“In markets like Latin America, the US or Australia, there are many projects that were delayed during the COVID times due to raw material and component shortages, higher logistics costs, higher installation costs, and COVID restrictions during turbine installations,” he notes.

Barla says the problems worsened last year as European turbine manufacturers were hit by high prices for a second time. The knock-on impacts of high fuel prices after Russia’s invasion of Ukraine meant their combined supply chain, commodity and logistics costs respecting onshore wind turbines increased 40-50 per cent in the eight quarters ending Q4 2022.

At the start of this year, European turbine OEMs remain stuck in the middle, saddled with penalties for non-delivery from developers on one side, and wrangling with their suppliers and shippers over costs on the other. “They are threatened by the developers because they could not simply get the delivery of the components because the component price has increased dramatically,” says Barla.

“The turbine OEMs could not supply the components or turbines in time, and the developers have to pay penalties to the grid operators or the energy regulators, with whom they have secured the projects in auctions. I know of certain projects that were delayed, and the developers are threatening the turbine OEMs with court cases,” says Barla.

Sometimes in markets like Australia where turbine OEMs enter into turnkey contracts, projects are delayed due to a lack of grid connection. Barla says, “This is no fault of turbine OEMs, but they still end up paying penalties to developers due to the lack of electrical commissioning of turbines. I don’t want to cherry-pick the projects, but I know several projects that were delayed in Europe, Brazil, Chile or Australia.”

OEMs charged with shipping 85-metre-long 7MW onshore turbine blades face a challenging task. “In Europe, if you think about some of the large-scale projects in Scandinavia, we are talking about hundreds of megawatts size, these projects warrant longer blades and taller towers,” Barla explains, adding, “That is good from an energy yield perspective. However, these new technologies also bring in other challenges such as logistics, which are a nightmare.”

Developers have noticed not just the delays, but higher costs for turbines. “Offshore prices are going up, but not to the same extent as onshore,” says Barla.

Kasra Jamshidi is a Founding Partner of Danish offshore wind project management consultancy Naver, advising both wind turbine OEMs and developers.

Jamshidi points out that Iberdrola’s US subsidiary Avangrid Renewables has flagged supply chain issues as a reason for its two-year delay to two offshore wind projects, 804MW Park City Wind and 1.2GW Commonwealth Wind. “As things look today, one observable trend is that projects are being delayed or cancelled until the market stabilises and all parties involved find a way to become profitable,” says Jamshidi.



Steel the commodity to watch

In the pandemic era, demand for global logistics was disrupted. Global ocean freight rates hit an all-time-high in 2021.

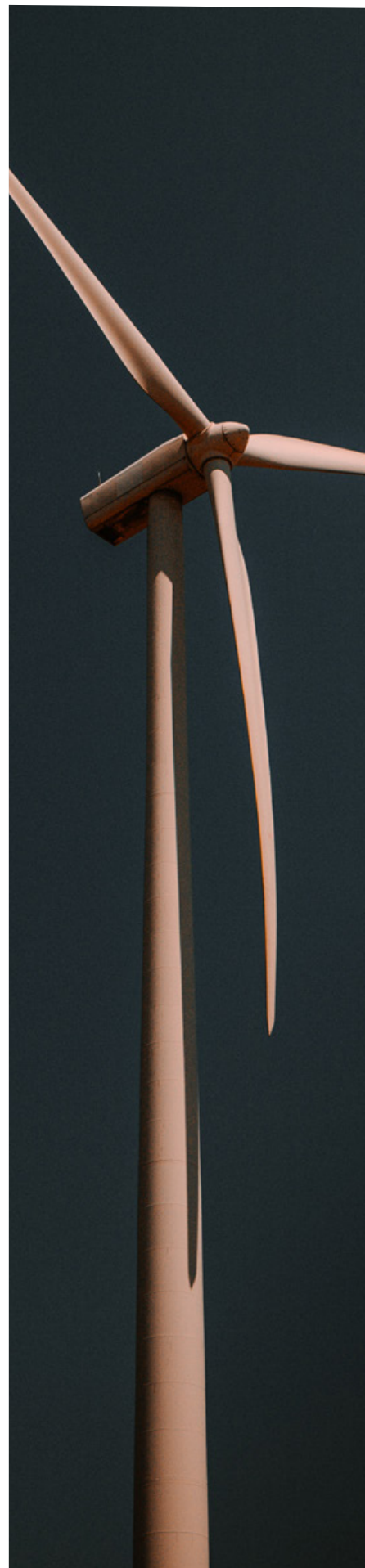
In the second quarter of last year, European turbine OEMs faced continued worries about the high price and availability of logistics. The European contract road freight rate index reached an all-time high, partly because diesel prices rose amid the war in Ukraine, and US freight rates rose 28 per cent year-on-year.

So far, this year's silver lining is lower logistics costs. Western ocean and road freight rates are on their way down as markets, fearing recession, put on the brakes.

But volatility in the price of fuel continues to worry European turbine manufacturers across the board after a US ban on Russian fossil fuel imports in March 2022 hiked oil prices, and Russia-EU tensions coincided with cuts to cheap Russian natural gas supplies.

"We are not yet out of COVID, and we have commodity price inflation, where a number of goods were hit by Russia's invasion of Ukraine and this energy crisis. It's like one after the other," Barla said, adding, "If you just look at the example of 30 per cent of European gas that used to be imported from Russia, that decline has had a significant effect on the overall prices of commodities."

While benchmark Brent crude oil prices appear to be on their way back down to pre-invasion levels, energy markets in Europe remain nervous. The EU's strained access to Russian natural gas supplies in August briefly impacted the price of diesel as natural gas is used in diesel refining, according to Argus.





Further, the EU in December declared a full embargo on Russian imports of diesel. As diesel is needed for transporting goods, higher-cost diesel could lead to higher costs for goods bought in the bloc.

OEMs are now most worried about the commodity input costs of wind turbines, says Barla. He points to the price of flat hot-rolled steel plates in particular, followed by the price of carbon fibre used in wind turbine blades, which increased dramatically throughout 2022 before flattening out. "One of the exposures with the turbine itself, as it makes up the majority of the turbine, is steel. You've seen steel prices fluctuate throughout 2022, and that has an effect on the turbine pricing," says Barla.

Steel, which makes up 50-60 per cent of turbine cost, is the commodity to watch in 2023, but high uncertainty and volatility has reportedly prevented some analysts from forecasting.

Steel prices had tripled to three times their usual level during the pandemic, and Russia's invasion led to another spike. It saw steel prices rise by \$500 per ton in Europe and the United States, before falling back below this level in mid-July, according to S&P Global. In the wake of the invasion, both the EU and US took action to prevent some Russian steel imports.

"Although [Ukraine] has largely stopped exporting, Brussels has not prevented imports of Russian slab due to the EU's dependence on this key raw material for the production of hot rolled plate," says Leo Rawlence, a steel broker based in the UK.

Lower steel prices in UK and Europe may be on the way, but not for long. “While prices have increased by 20 to 25 per cent for [hot rolled coil and plate] in the last six weeks to two months, I do not anticipate that this trend will last beyond the end of this quarter. It seems that volatility will persist in 2023 as supply chain disruptions, protectionism and environmental concerns or measures keep shifting the parameters of the global playing field,” says Rawlence.

In September, the OECD Steel Committee expressed concerns over the need to prevent a potential steel crisis emerging in the short- to medium-term, worsened by not only rising energy prices but also a range of inflationary factors.

Steel prices are having an impact on OEMs. “Steel is competitive and still very elevated, so that still exerts pressure on the big turbine OEMs. For most of 2023 and also all of 2024 I’d expect that companies like Siemens, GE and Nordex would continue to report losses,” Barla says.

Barla expects Danish turbine manufacturer Vestas may recover faster due to its premium price structure and cost controls.



Supply contracts add indexation

Wind turbine manufacturers in Europe are not standing idly by: They are pushing to add indexation mechanisms linking the price of commodities to the prices of turbines in supply contracts they sign with developers.

The mechanisms link to not only steel but also commodities such as copper, nickel and fuel. The move helps to safeguard their margins amid volatile pricing for raw materials.

It is thought that European OEMs are successfully ensuring the mechanisms are part of the contracts they are negotiating and signing now, says Jamshidi. “This is a direct consequence of the sudden hike in cost for such things which the OEMs have had to take the hit on because contracts up until this point didn’t include such mechanisms.

“And by doing so, this then adds risk to the business case seen from a developer point of view, as they would then have to add further contingencies or find creative ways to hedge the risk to show the lenders that the risk is identified and mitigations are in place,” he adds.

With respect to the typical offshore wind financing process, OEMs are taking the opportunity to leverage their risk concerns with developers during the parallel discussions developers have with lenders on risk and internal rate of return.



“Obviously, the OEMs play a major role in the developers’ ability to hit their targets on the IRR and, at the same time, convince lenders that the risks of the project are capped within whatever mandate is given to the project by the lenders before they would accept to issue financial close and allow the project to proceed into execution,” Jamshidi says.

Developers are focussed on several risks. They are concerned with OEMs’ ability to deliver on the signed contracts without the need for re-opening lending terms, conditions or pricing, but they also need to make sure OEMs can continue to produce for expected market growth in the future, he says.

Markets have pushed the balance of power in favour of OEMs in the contracting phase as it has become a “supplier’s market” where demand is higher than supply capability, whether due to OEM or commodity price issues, Jamshidi notes.

“The OEMs have been running with red figures for years. The shift in OEMs’ risk appetite and the need for OEMs to raise their prices and introduce indexation mechanisms has a direct impact on the achievable IRR for the projects in development today and the ability for the developer to say that all risks are capped,” adds Jamshidi.

Developers and OEMS should collaborate more so that negotiations look less like a ‘push risk away game’ and more like a ‘mitigate risks together game’, he says.

Recent delays to projects may serve as a preview of what markets would look like with fewer wind turbine manufacturers. “At present, the OEMs and their sub-suppliers’ ability to become profitable remains the main objective for the entire sector ... If one or more OEMs fail in becoming profitable and therefore disappear from the market, the competition that is necessary to improve on technology and pricing is reduced, making projects less profitable and achieving the renewable energy targets nearly impossible,” warns Jamshidi.

Outlook for Europe's OEMs

Hit by crisis after crisis, wind OEMs may finally have the spotlight. It seems like Western governments are taking some of the steps needed to help long-beleaguered OEMs survive.

European and American leaders promise to incentivise OEMs to build factories. The EU Commission has proposed a Green Deal Industrial Plan and EU Sovereignty Fund, while the US recently passed the Inflation Reduction Act. "It's certainly very encouraging to see that the industrial plan that encourages local manufacturing with components," Barla says of the EU effort.

Appealing to regulators, Spanish-German turbine OEM Siemens Gamesa published a paper proposing inflation compensation in state auctions for wind development and investment in more reliable supply chains.

New wind facility investments should be part of the EU's Green Deal Industrial Plan, and local content rules will mean manufacturers may have to reopen the plants they mothballed in the past few years, Barla adds. "I would expect that offshore [turbine] investments will flow into Europe, but whether it would make a difference to onshore, it is hard to say," says Barla.

Local content rules alone won't drive new supply chain investments, he says. "The most important thing besides the cost is the demand itself. If there is enough demand, you could still make decent margins by producing in high-cost markets like Europe. However, when we look at onshore, demand is declining, despite the fact that, overall, onshore installations in 2020 increased 5 per cent," says Barla, adding that the decline is partly due to fewer available sites.

In particular, there is a lack of incentives driving new European onshore wind supply chain investments, as for the next one to two years global onshore wind turbine demand may decline outside China. "Local content rules are not going to entice the OEMs to come and invest in those factories, even if there is a local content policy, because they're not going to make money. Unless there is a stable demand on the horizon, they're not going to bring back those investments," continues Barla.

"The most important thing besides the cost is the demand itself. If there is enough demand, you could still make decent margins by producing in high-cost markets like Europe"

**Shashi Barla,
Brinckmann Group**

Chinese wind turbine manufacturers don't face the same financial concerns. The main reason for this is Chinese companies receive three kinds of subsidies for manufacturing and producing parts, but European OEMs do not receive any in the markets where they operate. "We're not talking about a level playing field, and certainly when you think about the procurement of the materials that's talked about today," says Barla.

Material costs are lower for Chinese OEMs than they are for European ones, in particular for rare earth metals as China dominates global supply. China also has access to cheap steel as the world's largest producer and consumer. The fact that China's wind supply chain uses mostly interchangeable parts makes procurement easier for its OEMs, too.

In Europe, not just regulators, but also developers must do their part to help OEMs survive. "In Europe in general for developers I think the biggest challenge is to raise the auction prices, because the input costs have increased dramatically," says Barla. "The first thing that the developers are concerned about if turbine OEMs are raising the prices is they will also have to negotiate with the regulators to increase the auction prices."

Many governments index the prices paid for wind energy in auctions, but not enough, and the index prices link to can change between the time of bids and OEMs procuring their components. "Governments need to ensure full indexation," says association WindEurope.

Germany has already taken a "good stance" by raising onshore wind auction prices to from €58 to €73 per MWh, Barla adds. "Other countries will have to make sure that in the auctions – whether it is in the UK or in subsequent auctions in France, Italy or Spain – regulators take stock of the situation. They should acknowledge the cost increases, and they should raise the auction prices," says Barla.

The rising cost of construction debt in Europe, impacted by inflation, is another reason to award higher prices in auctions. Inflation doesn't impact balance-sheet financed projects as much as it impacts the project finance costs of smaller European wind developers. "For them the cost is going to be significantly higher because of the increasing interest rates," says Barla.

"If turbine OEMs are raising the prices [Developers] will also have to negotiate with the regulators to increase the auction prices"

**Shashi Barla,
Brinckmann Group**



A lower return for investors

The outlook for European offshore supply chain costs is elevated, but onshore supply chain costs are set to be higher.

Offshore projects face less cost risk because European turbine OEMS have longer project timelines during which to secure cheap supplies. “Offshore prices are going up, but not to the same extent as onshore, because in offshore you have a longer delivery time of four years,” says Barla.

But the impacts of financially weakened turbine manufacturers in Europe are set to be felt strongly in developing markets. The wind sectors most exposed could be those in new markets, for example in the US and selected countries in the Asia-Pacific, predicts Jamshidi.

Wind turbine manufacturers will be less tempted to venture into developing markets. This is because of the hike in risks threatening their baseline as they are trying to return to being profitable. It is especially true in developing markets with local content rules, says Jamshidi, as OEMS may prefer to supply projects closer to manufacturing facilities. “OEMs will, of course, also bid in emerging markets, but on their own terms and conditions and with premium pricing,” he adds.

Seizing opportunities for growth as countries ramp up wind incentives to meet 2030 climate targets, European wind stakeholders are likely to incorporate more risk structures in both supply and financing contracts and accept lower returns.

Jamshidi says, “Developers and investors are aware of the importance for the entire industry of ensuring that all players can achieve a profitable business to see the growth that everyone expects for the wind industry. This means that developers and investors would have to find ways to accept more risk and less financially attractive projects.”

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