



Offshore wind: Strategies for uncertain times

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The offshore wind industry is facing macroeconomic pressures that are halting growth and profitability. Developers can embrace four key actions to help navigate this changing environment.

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The offshore wind industry is at an inflection point. Having proved to be an increasingly scalable source of renewable energy, the industry has enjoyed a decade of growth and value creation.^[1] Offshore wind is a clean renewable energy source—one of the least CO₂-intensive forms of electricity generation, on par with onshore wind—and can help communities around the world meet their net-zero targets.^[2]

However, the current macroeconomic environment is impacting the offshore wind industry, putting pressure on its growth and profitability.^[3] Recently, stakeholders have questioned the outlook of the industry after seeing a relatively high density of project cancellations following communicated cost increases of between 40 and 60 percent. Can offshore wind costs rapidly return to attractive levels, or is the cost advantage of onshore wind and solar too large, despite offshore wind's favorable production profiles?

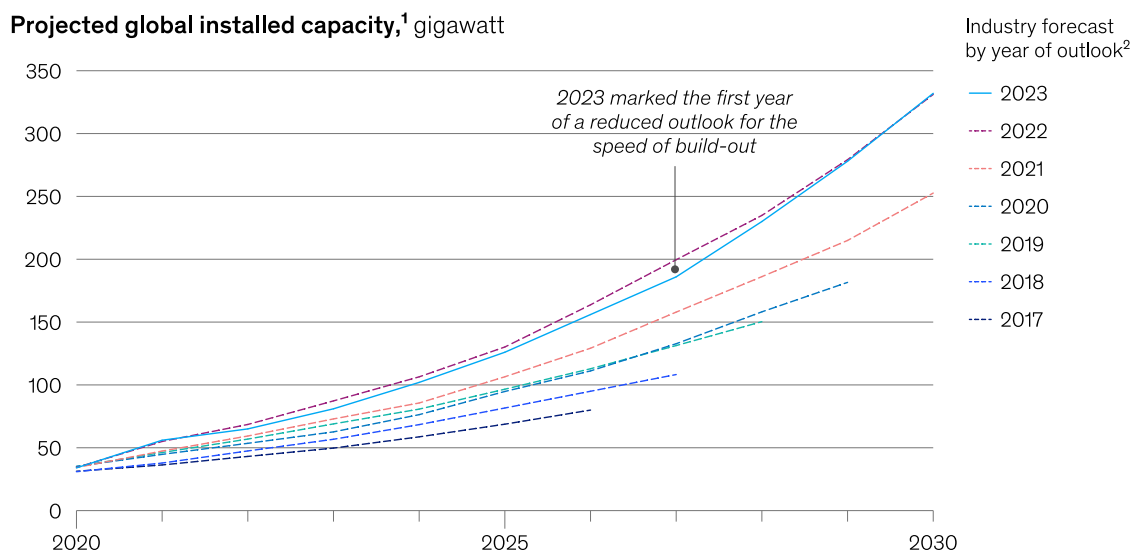
In this article, we discuss why the industry has been so hard hit and when it could reemerge into structural profitability. We delve into potential scenarios—based on in-depth discussions with industry executives and leaders—that could affect the outlook of the industry. We conclude with key steps that developers can take to ensure ongoing growth.

Offshore wind is coming off a decade of strong value creation

In the 2010s, the offshore wind industry experienced significant growth, making this technology increasingly affordable. The industry has understandably held an optimistic view of the future. Developers have remained profitable and seen volume growth year after year. Governments have viewed offshore wind as a complementary and clean source of energy, with potential to play a major role in the energy transition. Last year, global government targets for total installed capacity by 2030 exceeded 400 gigawatts [GW] (Exhibit 1).

Exhibit 1

Expected capacity growth has steadily increased until 2030, which marked the first year of down-adjusted expectations.



¹Including China.
²Wood Mackenzie annual industry outlook (base case).
 Source: Wood Mackenzie

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The global commissioned capacity of offshore wind increased from 3 GW in 2010 to approximately 66 GW in 2023—roughly enough capacity to meet Spain’s electricity demand, assuming a capacity factor of 45 percent.^[4] During this period, the cost of generation for offshore wind decreased by around 60 percent.^[5] This dramatic reduction in cost was driven by increased competition, low interest rates, and technology development and industrialization.

The industry holds significant room for growth; in theory, there is potential for 20,000 GW of fixed offshore wind, in addition to 50,000 GW of floating offshore wind capacity globally.^[6] It offers a way to generate electricity near coastal load centers, thereby reducing overall transmission costs. These regions are significant in that they make up about 40 percent of the population in offshore markets in the European Union and the United States.^[7]

The industry has been hard hit by the macroeconomic environment

Recent macroeconomic trends—rising raw commodity prices, interest rate hikes, and supply chain bottlenecks—have put pressure on offshore wind developers' profitability. This vulnerability is largely due to the industry's exposure to material costs, which has impacted financing costs and slowed down growth, especially in Europe and the United States.

As a result, our analysis shows that since the beginning of the decade many developers have experienced inflated project costs, with communicated levelized cost of electricity (LCOE) increases of around 40 to 60 percent compared to 2020. Further, many projects have contracts for difference (CfD) that are not inflation adjusted, rendering these projects unprofitable.

The industry is experiencing severe consequences—for example, only about 40 percent of capacity that was expected to reach a final investment decision (FID) in February 2022 had taken FID by the end of 2023.^[8] In addition to these delays, projects have been canceled in markets such as the United Kingdom and the US East Coast.

The role of offshore wind in future energy systems depends on progress across five dimensions

Following the macroeconomic shocks, it is uncertain when the industry will achieve structural profitability again. We see five drivers impacting the future of the industry: the position on the cost curve, the regulatory landscape, market pull, supply chain capacity, and developer behavior. These drivers can help us understand recent and future developments in the offshore wind industry and what circumstances may affect profitability (Exhibit 2).

Exhibit 2

The outlook of developer profitability is uncertain going forward, with a wide range of possible outcomes.

Drivers	Solution space of profitability drivers (through the cycle 2023–33)		
	<i>In favor of headwind aggravation</i>		<i>In favor of rapid recovery</i>
Position on cost curve	Diminishing cost position of OSW ¹ vs alternative renewable technologies	Slow convergence in cost position toward alternative renewable technologies	Rapid decrease in LCOE , ² putting OSW in line with alternatives such as solar PV and onshore wind
Regulatory landscape	Reaching government targets is not a priority , driven by, eg, a difficult macroeconomic environment	Budget constraints limit development and value creation	Commitment to reaching OSW government targets
Market pull	Fading momentum in climate policies , offtakers deprioritizing energy transition to remain competitive	Market pull expectations down from 2018–22 , but still see high demand for clean energy	Significant market pull with advanced commitment in decarbonization targets
Supply chain	Continued supply bottlenecks , with limited room for cost improvements	Situation slowly normalizing —but disproportionate value capture by suppliers	Wave of supply chain investments (eg, support regimes, acceptability of new entrants)
Developer behavior	Continuing high competitiveness and limited consolidation	Developers more selective in market presence and some consolidation happening	Sufficient consolidation and reset of strategic behavior

¹Offshore wind.

²Levelized cost of energy.

McKinsey & Company

Position on the cost curve

Increased material costs, inflation, interest rates, and competitive seabed tenders have increased LCOE expectations. The worsening cost position has created headwinds for the industry, which previously experienced regular year-over-year cost reductions. We have noticed that, as a result, offshore wind developers' profitability has been affected more so than that of onshore wind and solar developers.^[9] Offshore wind has experienced a 10 to 20 percentage point higher increase in costs compared to other renewable technologies, as seen in Germany (Exhibit 3). These same trends are widely observed in Europe and the United States. Even though the inflationary pressure and interest rate expectations have gone down since the beginning of the fourth quarter 2023, the current level of 4.0 to 4.5 percent for the US 10-Year Bond Yield is still at the higher end of the range seen in the previous decade.^[10] Recently, gas prices have also come down, similar to the levels in Europe before the 2022 energy crisis, challenging the relative affordability of offshore wind in many core markets.^[11]

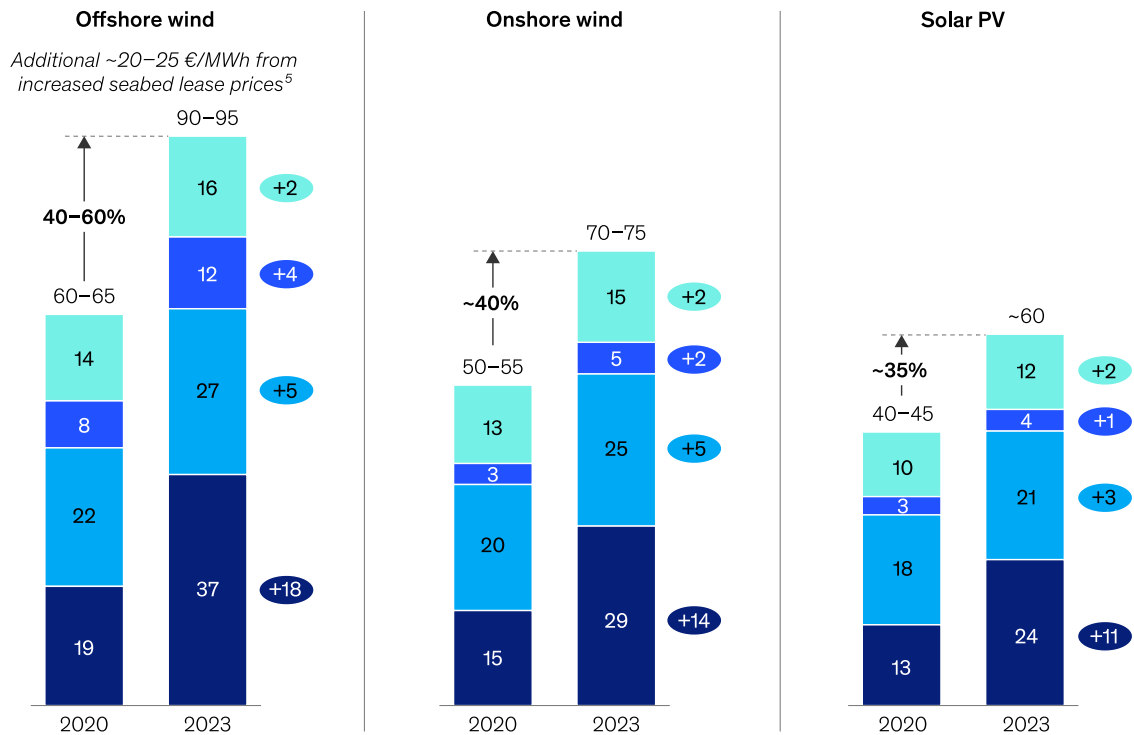
Exhibit 3

Offshore wind has been ten to 20 percentage points more exposed to cost-side shocks than other renewable technologies.

LCOE¹ Germany, € per megawatt hour (MWh) by year of FID² (nominal)

x Increase 2020–23

■ Financing cost³ ■ Capital expenditure—production and labor⁴ ■ Capital expenditure—materials ■ Operating expenditure



¹Levelized cost of energy. ²Final investment decision. ³Including land cost for onshore wind and solar PV and development expenditure for all technologies. ⁴Including weighted average cost of capital (3.3 percent in 2020 and 5.3 percent in 2023) as well as 150 basis points internal rate of return hurdle. ⁵Referring to German seabed lease auction (won by BP and Total Energies) with payment of ~€1.8 million/MW, of which 10 percent paid upfront and the remaining 90 percent spread over 20-year period (including financing cost of seabed lease); assuming FIDs in 2020 had little or no seabed lease cost—excluding potential revenue connected operating seabed fees.
Source: IEA; IRENA; Wood Mackenzie; McKinsey Offshore Wind LCOE model

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Regulatory landscape

Falling CfD strike prices and rising costs of competitive auctions in select regions have led to decreasing attractiveness of offshore wind projects. Strike prices challenge the expected offshore wind LCOE, which adds the risk of discouraging bidders from participation (for example, the United Kingdom's AR5).^[12] We have noticed that developers are attempting to renegotiate CfD contracts, despite obligation to deliver on contracts with governments.^[13]

In October and November of 2023, there were signs of significantly increased CfD prices in both the United Kingdom and the United States. The New York October 2023 CfD tender was approximately 50 percent higher than recently seen, while the UK AR6 auction criteria saw an offtake ceiling approximately 66 percent higher than that of AR5.^[14] 2024 will be a crucial year for the industry, with almost 70 GW of project capacity expected to be tendered globally, approximately three times the volume of 2023.^[15]

Market pull

The market pull for green energy is expected to be an important factor in offshore wind growth and its build-out as a scalable technology. The adoption of regulatory frameworks—such as the Renewable Energy Directive III (RED III), the Net-Zero Industry Act (NZIA) in the European Union, and the Inflation Reduction Act (IRA) in the United States—and other country commitments, will play a central role in the demand for green energy from offshore wind.

Supply chain capacity

OEMs in the offshore wind supply chain have in recent years experienced low margins, with indications of insufficient investment in supply chain capacity to meet government targets.^[16] Turbine OEMs have recently communicated a shift from growth and rapid innovation to a profitability focus going forward, including reducing the number of filed wind power patents and incrementally improving existing technology platforms.^[17] Suppliers are exposed to sensitivities such as utilization rates, subsidies, and supply chain capital expenditure (capex), as well as uncertain demand. We have seen that modest changes to such factors heavily influence the business case of various players along the supply chain. Improvements in the supply chain will depend on suppliers overcoming these issues in the near future and finding ways to derisk and accelerate investments. In the past months, we have seen early markers of a potential recovery of OEM margins and increased government support to players in the offshore wind supply chain.^[18]

Developer behavior

The global offshore wind developer landscape has become increasingly competitive over the past decade, following times of high profitability and optimism about falling generation costs. In addition, several larger independent power producers (IPPs) and oil and gas players have entered the space. We have noticed that developer competition has put pressure on profitability, driving down subsidies while pushing up the prices of seabed leases. However, between 2021 and 2023, there was a sharp drop in project pipeline realization, which may indicate initial signs of developers being uncertain about future market participation.^[19] With delayed or even canceled projects, penalization in financial markets, and reduced internal rate of return (IRR) guidance, the first signs of potential market exits and consolidation may be emerging.

The industry is facing more uncertainty than anticipated: Three possible scenarios

With the current levels of uncertainty, three conceivable scenarios for the next decade of the industry emerge. These have been developed through numerous discussions with offshore wind clients globally in the past 12 months.

The ‘structurally challenged’ scenario anticipates that developers and regulators cannot solve the current challenges and may gradually prioritize alternative sources of renewable energy that are becoming increasingly cost competitive. In this scenario, there will most likely be a continuation of the pattern of canceled or delayed projects, and frequent market or industry exits.

The ‘just for the heroes’ scenario expects that the industry will continue to grow despite its challenging cost position. Profitability will be structurally reset as the offshore wind margin premium evaporates compared to onshore renewables. In this scenario, industry leaders who are present in the “right” markets will be able to realize value-accretive projects.

The ‘profitability restoration’ scenario is one in which market forces help restore industry predictability and profitability, allowing for healthier developer margins in line with announced profitability targets or beyond.

After discussing these scenarios with market participants in the past months, our view is that the industry could be facing a “just for the heroes” scenario. In such a scenario, capacity additions will likely fall short of current industry growth expectations, with new projects representing approximately 10 to 15 GW per year over the next decade reaching FID—30 to 50 percent lower than many current industry scenarios.^[20] Large variability in performance between developers and markets could be observed with structural differences in profitability, resulting in less attractive markets gradually being deprioritized. Here, capacity additions will likely take place primarily in mature and self-sustained markets.

The belief in the plausibility of this scenario is based on expected developments in the macroeconomic environment, regulatory landscape, and market pull.

First, the macroeconomic environment is expected to experience prolonged difficulties, with commodity prices and interest rates above 2022 levels. Second, the regulatory landscape might gradually attract more capital, however, the speed of regulatory change will likely be influenced by expected budget constraints. Third, there is a trend toward increasing market pull for green power among transition leaders in select geographies, but cost is expected to remain an important factor.

Other factors, such as the position on the cost curve and supply chain issues, could point toward an even less optimistic scenario for offshore wind. We have also seen limited

developer consolidation to date—however, current project cancellations, delays, and market exits might be the first signs of future consolidation.

There are various key trigger events worth monitoring that might have a significant impact on the industry's future—including the outcome of upcoming seabed and CfD auctions, and commitment in the European Union and the United States to achieving net zero by 2050.

Thriving in a ‘just for the heroes’ scenario

[Previous McKinsey research](#) points to two types of business leaders that emerge during challenging times.^[21] The first type is cautious when dealing with volatility and uncertainty. These leaders concentrate on threats in the here and now, focusing on scenario planning, resilience preparation, balance sheet management, near-term efficiency drives, and inflation monitoring. They are in a strategic “wait and watch” mode as conditions unfold. Most senior executives fall into this category.

The second type of leader takes similar defensive actions, while also leaning into the volatility, using it as a catalyst to grab new opportunities. They think about the next decade, not just the next month, and rethink opportunities and strategy in light of current conditions. Stakeholders in the offshore wind industry could take inspiration from this approach. Of course, there is no silver bullet solution to position for continued value creation, however, there are four value-accretive mindsets that developers and energy companies could explore:

- 1. Taking smart and controlled market bets with foresight, while investing in seed options to provide further opportunities in the case of an upswing.** Given the nature and size of offshore wind projects, efficiently deciding on capital allocation across geographies is critical—for example, focusing on investments in countries with inflation adjustments and low technology risk. Investing in options for potential build-out in the case of a rapid change in the macroeconomic environment could also be beneficial. In addition, it would be critical to invest in bidding excellence and understand how to develop a strong value proposition for nonprice criteria.
- 2. Developing an active stance on consolidation.** Developers could carefully assess potential inorganic opportunities and, if possible, explore the feasibility of investing anticyclically to rebalance growth.
- 3. Focusing on maximizing efficiency to prepare for a future horizon of lower structural profitability.** Developers could explore new organizational structures to quickly adapt to the shifting circumstances of the offshore wind market and consider identifying opportunities to increase performance across development expenses, operating and capital expenditures, as well as pursuing financial discipline.

4. **Establishing strategic supply chain collaborations, creating transparency and predictability.** Developers could explore supply chain collaboration, including vertical integration of strategic suppliers and direct sourcing from tier two and tier three suppliers. Energy companies could create transparency on project pipelines with OEMs and key suppliers, establish strategic partnerships to secure volumes, and carefully explore and assess technical improvements and value-creation opportunities in the supply chain.

The offshore wind industry is facing significant challenges in the current macroeconomic environment. However, developers can take steps to navigate this changing landscape to ensure continued growth. By taking smart market bets, actively considering consolidation, maximizing efficiency, and collaborating strategically with suppliers, developers can position themselves to thrive in volatile times. While the industry's future profitability is uncertain, there are early signs of improvement, and we remain optimistic about the potential of offshore wind as a clean and renewable energy source.

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