

CAPEX in Energy

Procurement at the heart of CAPEX delivery



Energy



This paper explains why procurement expertise is a key strategic asset for energy companies – and how they can use it to transform their CAPEX project delivery.

Key Insights

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Why procurement must move to the centre of energy CAPEX delivery

2. About the Research

Insights from 389 senior leaders shaping €1 tn in investment

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What's driving the surge in spend – and straining supply chains

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From tactical to transformative:
The future of CAPEX procurement

Unlocking **energy CAPEX** delivery starts with stronger procurement

Companies in the energy sector need to deliver higher volumes of capital investment in a cost-efficient manner.

To do so, they must overcome multiple challenges including extended project lead times due to stretched supply chains, and separately, surging costs that increasingly challenge investment assumptions. At the same time, suppliers have increased their margins and are reluctant to assume greater project risks, challenging the sector's established outsourced model of project delivery.

The solution is to **ensure procurement teams play a much more strategic role across CAPEX investment pipelines** and throughout the project life cycle. Anticipating and managing supply chain risks, securing reliable supplier relationships, and ensuring long-term availability of critical materials and resources are fundamental steps to enable reliable and affordable project delivery. To achieve this, procurement teams must have access to the talent they need to manage complex supplier networks and implement contracting strategies that balance cost, risk, and project delivery requirements.

Based on the results of Inverto's CAPEX Procurement in Energy study, senior leaders responsible for CAPEX procurement have identified the following priorities:

- Achieving a comprehensive overview of the CAPEX portfolio to **strategically manage resource allocation, project risks, and execution**. Wherever possible, the goal should be to bundle procurement across projects and standardize specifications to achieve greater efficiency.
- **Strengthening teams** and developing strategic procurement capabilities, supported by cross-functional collaboration and enhanced digital tools.
- **Forming strong, strategic relationships** with key suppliers that promote transparency and risk-sharing.
- **Aligning procurement with project delivery KPIs**, notably on-time and on-budget delivery, as well as ESG objectives to meet current and future regulatory requirements.



Key points from Executive Summary

- Rising CAPEX budgets must be delivered on time and within cost targets, despite supply constraints and inflationary pressures.
- Procurement must respond strategically, as supplier margins—not just material costs—have recently increased.
- Success depends on building strong supplier partnerships, involving procurement earlier, and securing the right talent.

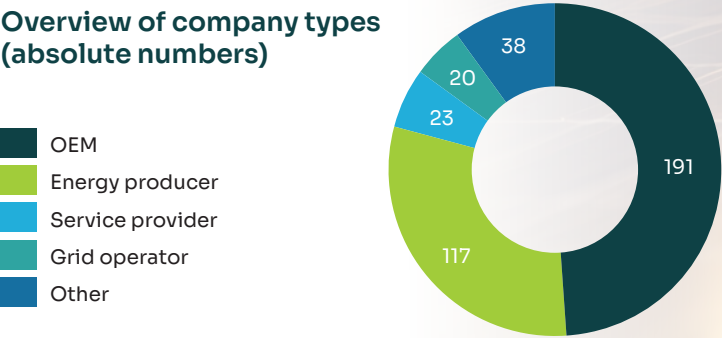
What 389 senior decision-makers told us about the future of energy procurement

Our CAPEX Procurement in Energy study is based on responses from 389 executives from companies in six markets: France, Germany, Spain, the Nordics, the UK and the Middle East.

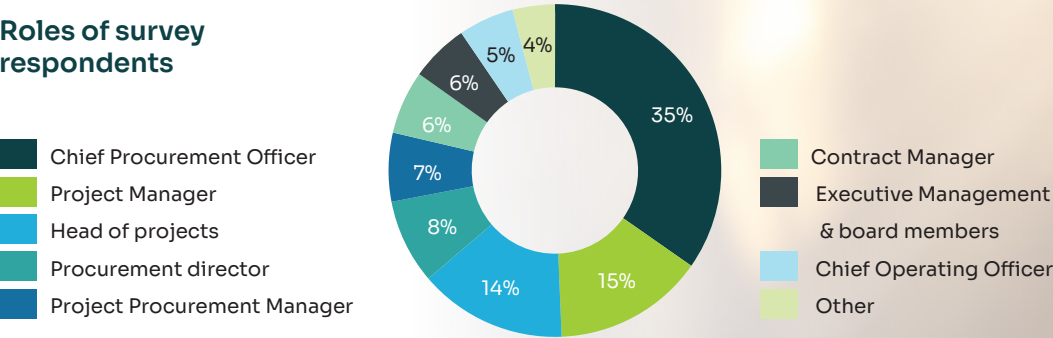
Around half the respondents were board members, and half of the companies covered maintained annual procurement spending, including CAPEX, of more than €1.5 bn. In aggregate, the companies that took part in our study accounted for approximately €1 tn of CAPEX in 2023.

Some 49% of the companies included in our study are Original Equipment Manufacturers (OEMs), 30% are energy producers, 6% are service companies, and 5% are grid operators.

Overview of company types (absolute numbers)



Roles of survey respondents





Why energy leaders are **rethinking** how to build for **the future**



The scale of CAPEX required in the energy sector has grown steadily over the past few years, reflecting the increased number and size of capital projects required to deliver the energy transition.

For example, the International Energy Agency (IEA) notes that although transmission and distribution (T&D) grid investment is just one component of the broader CAPEX landscape, it provides valuable insight into the growing pressures across the sector — including energy producers, OEMs, and critical infrastructure providers. Between 2012 and 2021, annual T&D investment averaged \$187 bn. It is forecast to rise to \$356 bn by 2030 and a decade later to exceed \$1 tn per year, reflecting the infrastructure expansion needed to meet net-zero targets. In total, the IEA estimates that \$25 tn will be required by 2050, a figure comparable to the investment needed to expand global solar and wind capacity over the same period.

The oil and gas sector is also set to see a significant rise in capital investment, as companies adapt infrastructure and capacity to meet evolving demand and decarbonization goals.

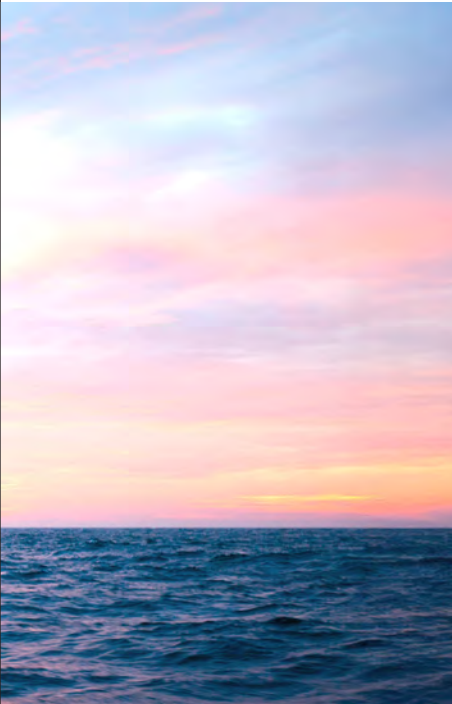
This surge in investment is being driven by several interrelated factors:

Energy transition and demand growth

- The growing integration of renewable and distributed energy sources
- More complex demand patterns requiring flexible delivery models
- Rising electricity consumption due to electrification

Infrastructure challenges and risks

- Aging grid infrastructure in need of modernization
- The need to strengthen grids against extreme weather events and cyber threats



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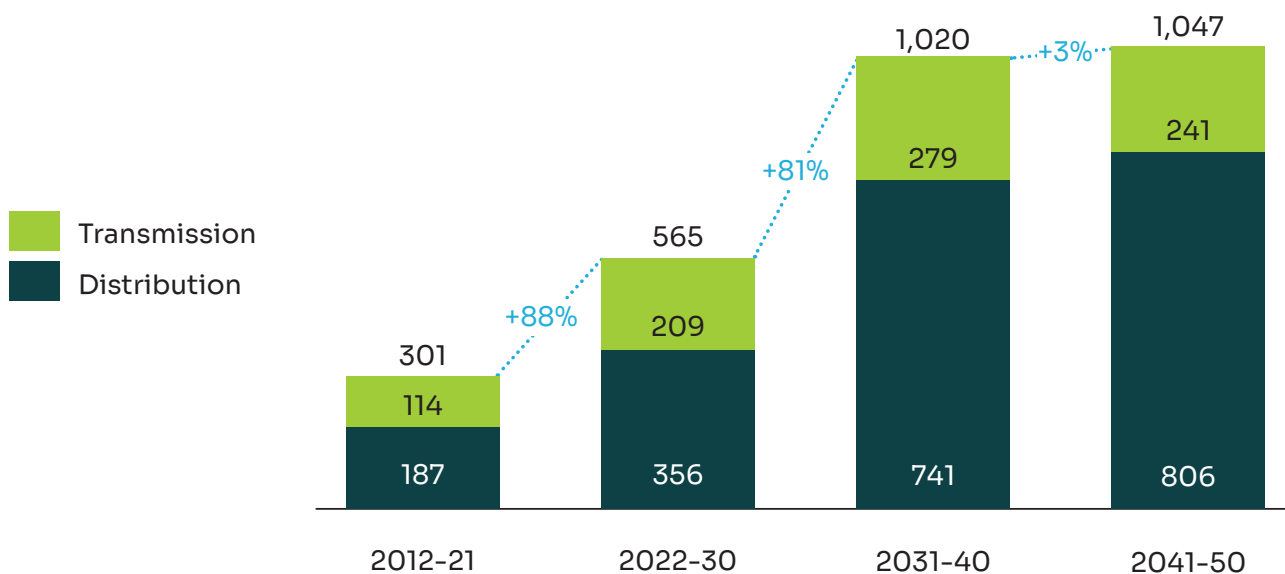
Supplier markets that used to be fairly stable, especially in oil and gas, are now under real pressure. We’re seeing long-lead-time items becoming harder to secure, not just in power and renewables, but across oil and gas too.

With global demand pushing capacity limits, companies that move early to lock in supply will have a real advantage when it comes to keeping projects on track.



Kevin Domnick
Principal

Average annual investment in global T&D networks by decade - NZE scenario (\$bn)



Note: Based on the International Energy Agency (IEA) Net Zero Emissions (NZE) by 2050 Scenario.
Source: IEA Outlook 2022; BCG Center for Energy Impact: Blueprint for the Energy Transition; BCG Analysis.

These CAPEX projections underscore not only the scale of investment required but also highlight the broader pressures facing procurement and supply chains across the energy sector.

Surging demand and supply shortages have shifted negotiating power toward suppliers, who are increasingly reluctant to take on project risks or commit to long-term agreements. In response, **procurement teams must take a more proactive approach** – anticipating risks, deepening supplier collaboration, and applying greater strategic foresight in contracting.

The key challenge facing companies in the energy sector is to overcome these constraints and ensure their supply chains can deliver much greater volumes of CAPEX over the next few years. They must achieve this while also adapting their procurement strategies to comply with new regulations, notably ESG-related rules in Europe.



Inverto's CAPEX Procurement in Energy study explores the challenges companies across the energy sector face in securing reliable supplier relationships as project demands increase. Grid operators and OEMs are struggling with long project lead times, driven by supply chain constraints and growing competition for critical resources. At the same time, in markets experiencing exponential demand increases, potential delivery partners are becoming less willing to bear the risk of major CAPEX investments alongside the project owner. This is leading to stricter contract terms, such as higher upfront payments, risk-sharing mechanisms, and price escalation clauses – shifting greater responsibility on to asset owners.

In response, companies are adopting strategies to strengthen relationships with critical suppliers and position themselves as a partner of choice. These strategies include improved risk-sharing mechanisms, enhanced contract structures, and closer collaboration with suppliers to secure long-term project delivery.

This imbalance of supply and demand has put procurement firmly in the spotlight, underscoring the need to position it as a highly strategic function. However, many energy procurement organizations report that they are lacking both the resources to handle the growing volume of required spend and investment, as well as the specialized skillset needed to manage critical supply strategies and projects. Compounding these challenges, procurement teams are often brought into the CAPEX process too late, sacrificing the strategic benefits they could deliver if they were part of a cross-functional project group from the outset.



Stefan Benett
Managing Director



Getting procurement involved from the start isn't just about overcoming supply chain constraints — it's about making smarter sourcing decisions.

Companies that align procurement priorities across projects will be far better positioned to secure resources and keep CAPEX on track.



Due to the high demand and comparatively low supply, there is an imbalance, which leads to suppliers having pricing power and poses a challenge in terms of procurement.

From **risk to opportunity:**
What the data reveals
about procurement
today

Our analysis of responses to the Inverto CAPEX Procurement in Energy Study has resulted in six major findings, which we detail below:

4.1 CAPEX procurement faces rising expectations:

Companies in the energy sector are finding it harder to deliver CAPEX projects on time due to shortages of critical materials and a lack of skilled procurement professionals. In fact, 30% of respondents report a shortage of staff skilled in CAPEX procurement, a capability gap that is impacting project efficiency and regulatory compliance, especially related to ESG.

The impacts vary across sectors and regions but are widely felt. When asked to rank their most pressing challenges, respondents cited long lead times and poor availability of critical supplies as the top concern (23%), followed by lack of skills in project procurement, unpredictable cost inflation, and the increasing regulatory burden.

Across different sectors, these challenges take distinct forms:

- OEMs struggle with supply chain disruptions and contractual disputes, making supplier engagement critical.
- Grid operators experience severe delays and cost escalations due to their reliance on outsourced project delivery.
- Energy producers face strict regulatory requirements that add complexity to CAPEX planning and execution.
- Service providers are responding by investing in digital solutions to improve procurement efficiency.



Björn Krämer
Senior Project Manager



Procurement teams are under more pressure than ever—not just due to capacity and skills shortages, but because managing risk and securing supply has become much more complex.

Without the right expertise and tools in place, it's hard to unlock procurement's full potential and keep projects on track.

4.2 Energy companies' top priority is on-time delivery:

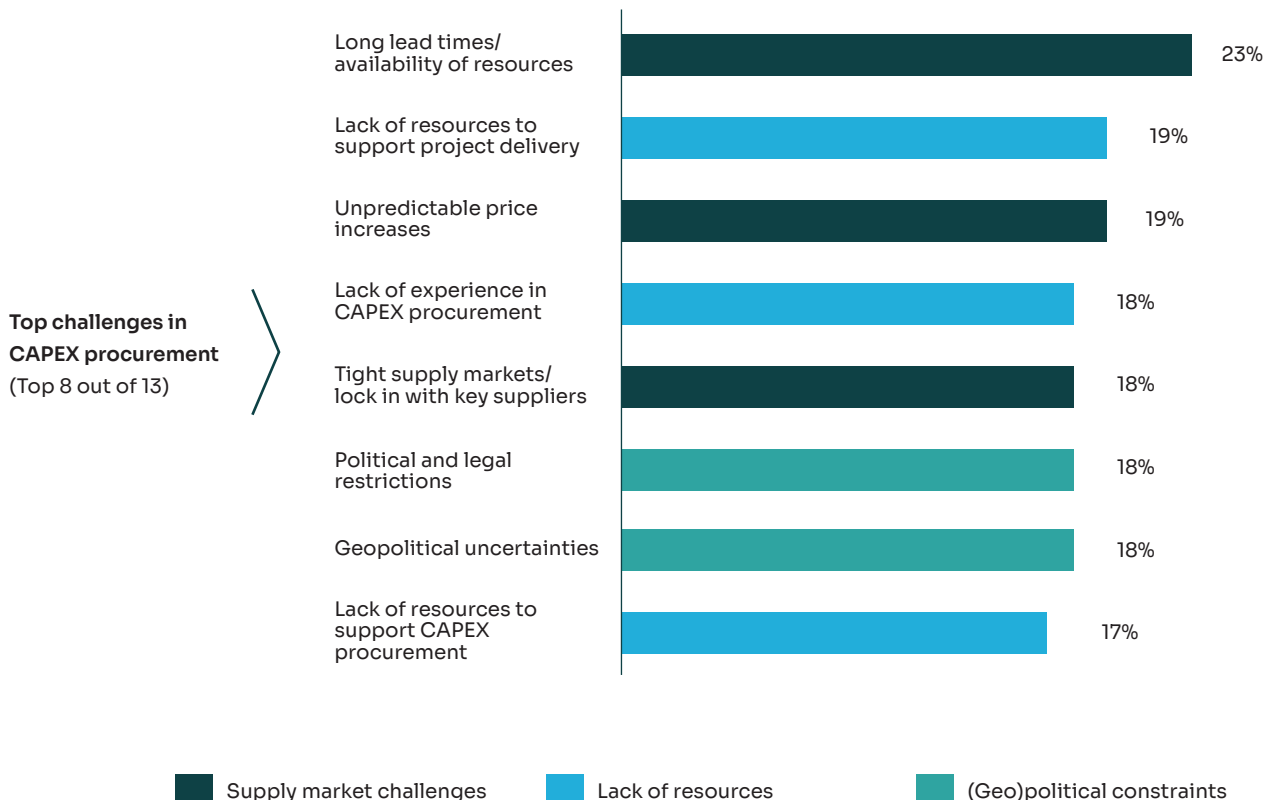
For almost two-thirds of companies in our study, on-time delivery is the priority, well ahead of maximising the net present value of investment projects (50%) and delivering them on budget (47%). This is a highly relevant finding, and one we also observe in practice: companies are often willing to accept price premiums to ensure the delivery of projects according to predefined long-term planning cycles.

While this may seem counterintuitive, it reflects the unique nature and strategic value of energy assets, where delays can have broader system or regulatory impacts. Still, beyond a certain threshold, affordability remains a limiting factor, particularly in overheated supplier markets.

The implication for procurement leaders from this finding is clear: they must bolster supplier relationships, optimize supply chains, and strengthen procurement teams to manage their project delivery risks.

Among the different types of company, different areas of priority emerge from the research: OEMs engage strategically with suppliers to mitigate delays and shortages; service providers focus on improving digital capabilities; grid operators aim to accelerate delivery by optimising their CAPEX demand planning.

Top challenges in CAPEX procurement



Source: Inverto CAPEX Procurement study — multiple responses, 389 participants

CAPEX Strategies by Sector



OEMs

- 23%** focus on **demand forecasting and management** to optimize CAPEX allocation.
- 21%** implement **Total Cost of Ownership (TCO)** approaches to improve cost efficiency.
- 20%** use **variable cost models** to manage price fluctuations and secure competitive bids.



Grid Operators

- 50%** prioritize **demand planning** to align CAPEX with forecast needs.
- 40%** report **acquiring stakes in key suppliers** to secure access to critical resources.
- 17%** focus on **long-term agreements (LTAs)** to mitigate supply risk.



Energy Producers

- 20%** focus on **specification optimization** to improve project performance and cost control.
- 19%** emphasize **compliance with regulations**, including ESG requirements.
- 16%** use **strategic supplier engagement programs** to enhance relationships and secure materials.



Service Provider

- 28%** prioritize **demand forecasting** to improve procurement efficiency.
- 28%** invest in **vertical integration** to secure critical components and services.
- 17%** rely on competitive **RFP processes** to drive cost efficiency.

4.3 Companies overwhelmingly outsource project delivery, but these delivery models face challenges:

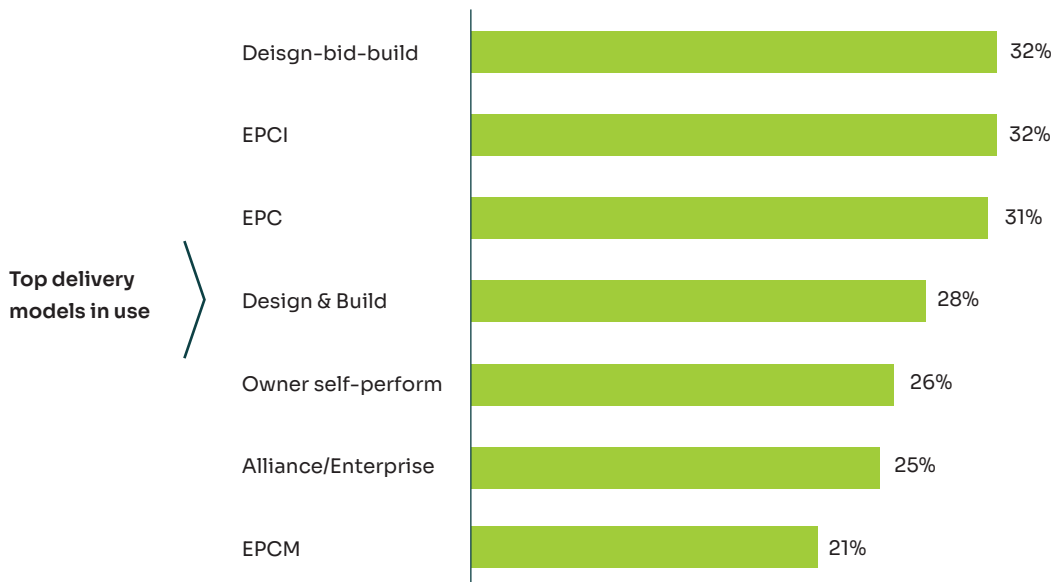
Respondents show a strong preference to work with EPC or EPCI (engineering, procurement, construction and installation) partners, and many use a design-bid-build model to deliver large CAPEX projects. This is particularly the case for grid operators, which tend to have small in-house teams and have therefore relied historically on external project partners. By contrast, OEMs and energy producers seem to be more open to mixed models, using their own resource and skills where possible to balance cost control and flexibility.

In terms of pricing, different models are in use, with one-third of respondents preferring guaranteed maximum price and lump sum models. Owners increasingly seek to avoid unexpected price escalations and risks that could disrupt project budgets and timelines. This preference highlights the importance of realistic forecasting of price levels to minimize the risk of cost overruns.

However, outsourcing project delivery is becoming more challenging. This is due to limited availability of project partners willing to deliver projects based on a traditional EPC(I) model, and to a broader shift in how these partners choose to engage, with many moving away from turnkey models in favour of less risk-heavy support. With project volumes so high and limited EPC(I) capacity available, the burden on the remaining EPC(I) partners is increasing, making project execution riskier.

As a result, energy sector companies can no longer afford to delegate the management of complex and stressed supply chains to prime contractors. Instead, they must become much more deeply involved themselves in the supply chains on which their delivery partners depend, managing them directly to ensure problems are anticipated and projects can move forward. Their capacity to assume this role depends critically on skilled procurement teams.

Outsourcing versus Self-Perform Models



Note: Multiple responses were possible. The chart shows the top selections most frequently mentioned by participants.
Source: Inverto CAPEX Procurement Study 2024

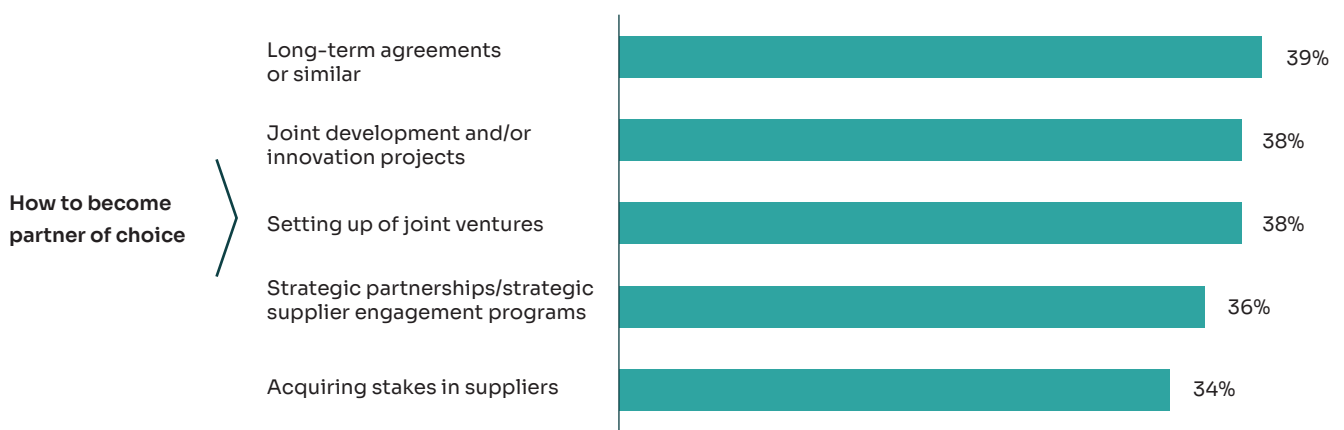
4.4 Consequently, CAPEX-heavy energy companies are seeking closer integration with key suppliers to become ‘partners of choice’:

Respondents report using various approaches to secure ‘preferred client’ status with key suppliers, thereby assuring access to critical long-lead-time components, resources and services with constrained availability. The most widespread strategy is to sign long-term agreements with suppliers (39%). Beyond this, many respondents apply a broader range of strategic approaches, such as joint developments or innovation projects, corporate joint ventures (JVs), strategic partnerships and the acquisition of stakes in key suppliers. Beyond securing critical resources, this underlines a transition from transactional collaboration toward partnerships that enable joint risk identification and mitigation in a dynamic and uncertain environment. Applying these strategies has become critical to the successful awarding of large-scale projects.

Companies across the energy sector practise many of these approaches, with long-term agreements that integrate suppliers into strategic development projects most common among OEMs. OEMs also strategically engage with their key partners to drive value and innovation. Energy producers favour strategic supplier partnerships and JVs, while joint development projects and JVs are the main tools used by service providers. Among grid operators, acquiring stakes in key suppliers is the main approach reported, coupled with efforts to improve the accuracy of demand planning.

The survey shows that, alongside efforts to create deeper partnerships with important suppliers, companies are taking measures to improve their oversight of projects. Two of the most commonly reported actions include (1) optimising project governance, and (2) developing strong claim management teams to address risks of cost escalation. These findings are based on multiple responses, reflecting the top priorities from a broader set of procurement strategies identified in the study.

Strategies to secure preferred partner status



Note: Multiple responses were possible.
Source: Inverto CAPEX Procurement Study 2024

4.5 But procurement teams are becoming involved too late in the CAPEX process, sacrificing the strategic benefits early involvement could bring:

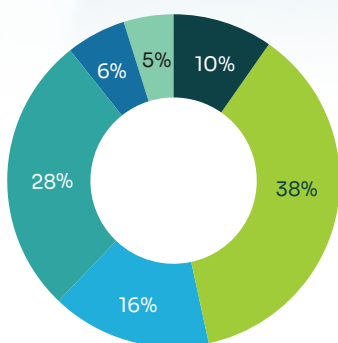
The big opportunity for companies is to involve procurement earlier, which enables much closer collaboration between internal teams. The stage at which procurement is engaged is a good indicator of its role within the organization. Early involvement signals a more integrated, strategic function, while late engagement often limits procurement to a transactional role. However, the widespread shortage of skilled procurement professionals that our survey highlights is preventing companies from taking advantage of this obvious opportunity. The critical question is not only what benefits early involvement could bring but also whether all stakeholders are prepared to support and enable it.

Our study finds that procurement plays a leading role in only 10% of CAPEX project portfolios, but its role is expanding, with 70% of companies reviewing portfolios for procurement synergies. Only 5% of respondents regularly update projects in response to market developments. This highlights a significant missed opportunity for more proactive project management and diverges sharply from other industries, such as automotive, where procurement plays a much more central role in strategically shaping supplier relationships along the chain.

Just 17% of respondents say procurement teams become involved in CAPEX projects at the portfolio planning stage, and 20% during project conceptualisation. Grid operators, which typically have small in-house teams and favour fully outsourced delivery models, are among those that involve their procurement teams relatively early in the process, during the specification and project definition phase. Energy producers take a similar approach to mitigate risks. By contrast, 24% of respondents say procurement does not get involved until projects reach the sourcing and contracting stage. OEMs say they focus on procurement during the execution phase to enhance operational efficiency.

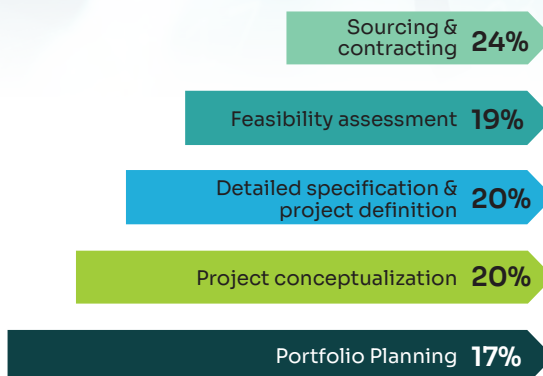


Procurement's role and involvement timing in CAPEX projects



Note: Share of CAPEX projects where procurement plays a lead, advisory, or minimal role. Single choice response.

Source: Inverto CAPEX Procurement Study 2024

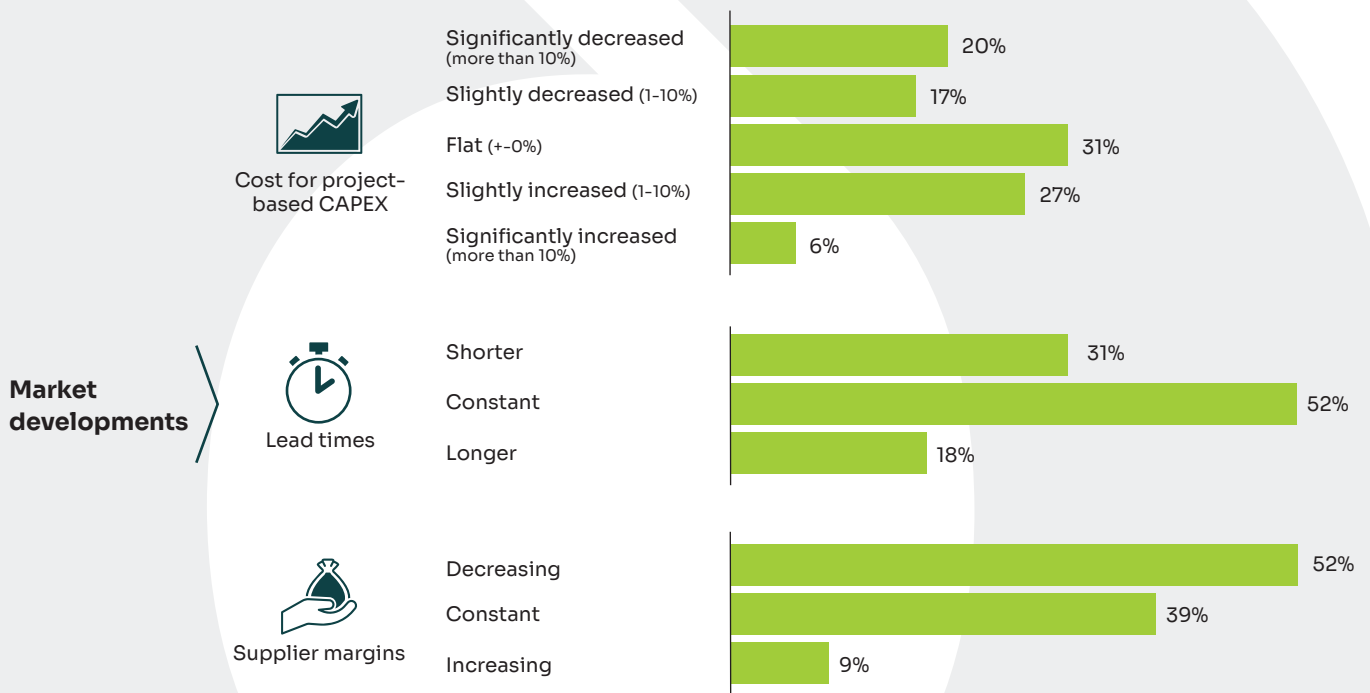


Note: Stage at which procurement is typically first involved in CAPEX projects.

4.6 Despite these challenges, 52% of respondents expect supplier margins to shrink over the next three to five years, thanks to competition and enhanced procurement strategies:

More than a third of respondents expect this margin contraction to reduce CAPEX project costs, although a similar proportion expect costs to increase (33%). However, only a small minority (6%) expect a major cost increase, though expectations vary by sector. On lead times, 52% expect no change while 31% anticipate some improvement.

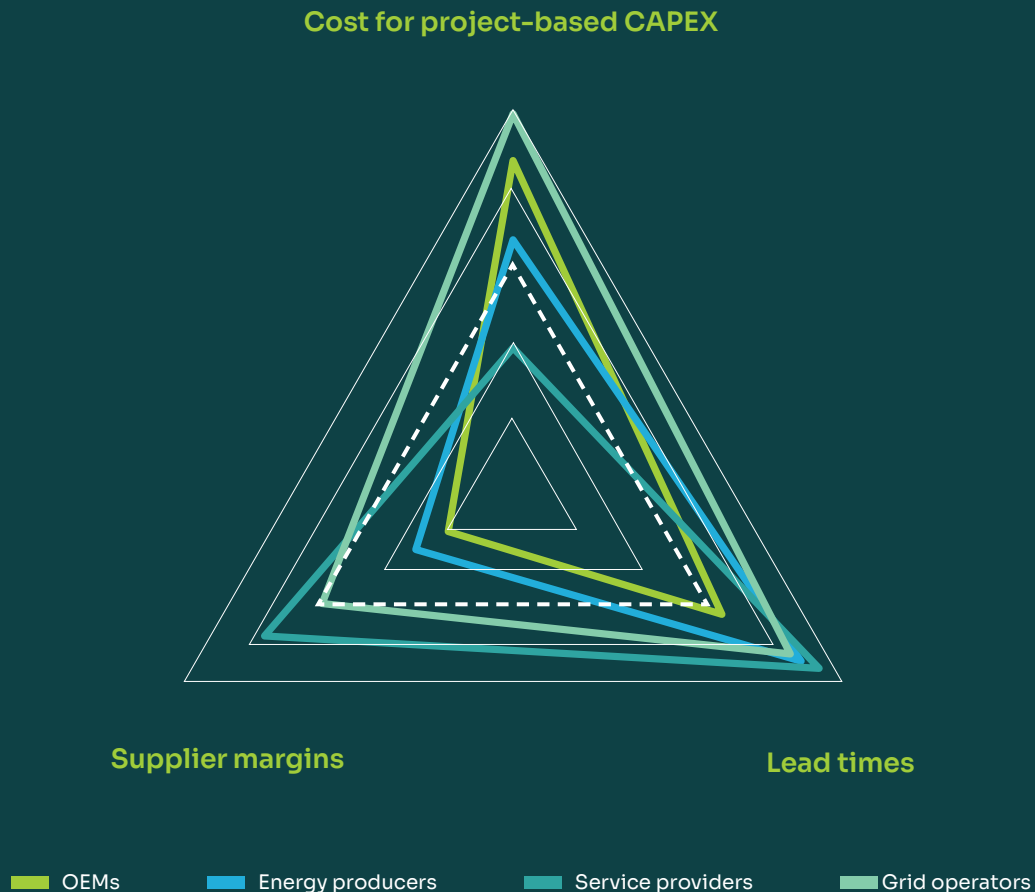
Key CAPEX trends over the next 3–5 years



Note: Multiple responses were possible. Source: Inverto CAPEX Procurement Study 2024

Inverto CAPEX Procurement Triangle

Grid operators anticipate the most CAPEX pressure



Note: The white dashed triangle represents stable conditions, where CAPEX costs, supplier margins and lead times are expected to remain unchanged. Movement outward from this triangle indicates an expected increase; inward indicates a decrease.

Source: Inverto CAPEX Procurement Study 2024

To illustrate the differing outlooks among study respondents on three major parameters – project-based CAPEX costs, lead times and supplier margins – we developed the Inverto CAPEX procurement triangle. This helps to visualise shifting expectations around CAPEX delivery across the energy sector.

The critical question is how these interdependent factors will evolve over the coming years. The findings suggest that, for most company types in our research, at least one of these parameters will see a meaningful improvement over the next 3-5 years. The exception is grid operators, who expect challenges to remain on all three dimensions.

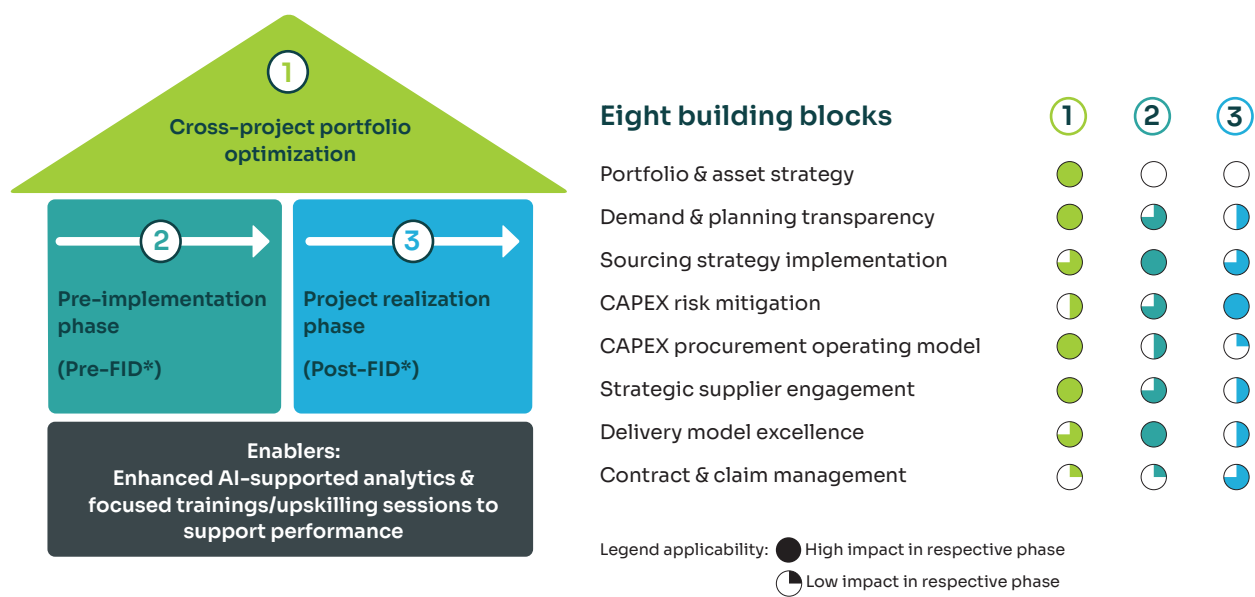
Against this backdrop, companies must be prepared to negotiate more favourable terms to lock in the CAPEX cost reductions they anticipate. They will also need to invest in supply chain management and logistics capacity to capitalise on reduced lead times.

Eight priorities to strengthen procurement across the CAPEX life cycle



Based on our experience, eight building blocks are particularly important for improving procurement performance and its contribution to CAPEX project economics and outcomes in the energy sector.

Procurement priorities across the CAPEX lifecycle



*Final Investment Decision
Source: Inverto CAPEX Procurement Study 2024

The focus of value-adding procurement activities largely depends on the delivery model of projects as well as the stage of the project life cycle:

From a **cross-project portfolio perspective**, key decisions at this stage include setting the overall CAPEX strategy, forecasting demand effectively, choosing the right procurement operating model, and defining how and when to engage with suppliers strategically.

As companies plan for long-term project delivery, they must also anticipate the impact of ESG regulations and geopolitical influences - integrating these considerations into a broader supply chain strategy to ensure resilience, compliance, and continuity in critical spend areas.

As companies **prepare for** the practical challenges of **implementation**, topics such as executing the sourcing strategy and ensuring the quality of the delivery model are key. The selection of the delivery and pricing model is also a critical milestone in this phase, as these decisions significantly influence later project stages and are often difficult to reverse. Efficient and customizable digital tools that track project progress and performance are also vital for successful execution.

When projects move into the **delivery phase**, mitigating CAPEX risk and managing contracts and claims are key. Even at this late stage, consistent and rigorous action can generate significant value - through proactive optimisation of cost-plus procurement processes, refinement of technical specifications, or other targeted purchasing measures.

To enable procurement teams to participate fully and contribute effectively, they must have the resources, tools, and knowledge to achieve excellence across all eight of these areas.

Executing an improvement plan across these eight topics requires companies to target four priorities:

- A baseline assessment of current CAPEX procurement capabilities, along with effective demand planning across projects
- Evaluation of the most appropriate sourcing strategies for key categories based on the company's needs and characteristics
- Decisions on portfolio set-up, including procurement contributions on project governance and the scoping of optimized delivery models
- Planning for implementation and management of delivery partners.

Building a transformation roadmap

While the eight building blocks highlight typical priorities, full-scale transformation requires time, effort and coordination. Senior procurement leaders should therefore consider adopting a structured transformation roadmap to embed these actions across their CAPEX procurement teams.

Based on our experience, a **four-phase approach can improve performance across the full procurement lifecycle** — from early portfolio reviews and investment planning through to project execution and ongoing optimization. Though timelines may vary, this framework provides a practical model for turning strategic intent into long-term implementation and lasting impact.

1

Portfolio review & initiative building
~2 months

Review of ongoing/planned project portfolio, delivery models & contracts (risks, best practices, key decision needs)

Long-term **projection of demand**, reconcile with financial planning & investments

Review status of procurement, identify **key initiatives on main categories** with cross-functional teams & prioritize

Prepare for **cross-functional investment optimization effort** (resources, setup)

*CCM: Contract & Claim Management
*FEED: Front-End Engineering Design
Source: Inverto CAPEX Procurement Study 2024

Holistic 2-year CAPEX procurement transformation in 4 steps

2

Key decisions
& target setting
~2 months

Prioritize cross-functional strategic initiatives

(value, timing for decision/ action, time to impact)

Calibrate potential value from “stepping up” (benefits in terms of cost/resilience/ time, related risks for asset base, required resources)

Develop a target ambition – across and within projects, estimate on potential impact for project pipeline

Develop **action plans** & establish **governance to build best practices** ahead of and within projects

3

Strategic initiatives
& direct impact
~8 months

Establish a **cross-functional governance team** to enable success

Implementation of key initiatives

, depending on project status:

- Cross-portfolio: New capabilities, e.g., CCM* workflows/tools
- Pre-FEED*: Long-term sourcing strategies, long-term commitments
- Post-FEED*: Advanced tender support, cost benchmarking & CCM
- Enablers: Operating Model, Tools & Analytics

Review of **progress & resource requirements**, systematic **rollout of best practices**

4

Ongoing optimization
~12 months

Transfer good practices into annual optimization cycles:

- **Cross-functional strategic ambition** & key decision needs
- Long-term implementation of **cross-functional enablers**
- Consistent development and **implementation of further optimization measures** along cross-functional processes
- Regular consideration of **market developments** & proactive application of countermeasures

Continuous development of **necessary skills for CAPEX procurement excellence**

Consistent **tracking of results** along standardized metrics and KPIs

Key elements of the process
have become more **complex**
and **strategically** important

Today's challenging geopolitical situation, combined with the need to scale investment in energy infrastructure, is reshaping the CAPEX procurement landscape. Key elements of the process have become more complex and strategically important.

To respond effectively, companies must build the internal capabilities required to identify and manage these challenges.

We expect supply chain constraints to persist, which will impact the viability and timing of ambitious CAPEX plans.

Energy companies will have little choice but to focus more rigorously on CAPEX efficiency and to take firmer and more direct control of their value chain. This will require a proactive approach to risk management — anticipating issues such as specialized transport for oversized components, coordinated multi-site logistics, just-in-time delivery to avoid construction delays, and robust claim management to reduce the impact of cost and schedule risks.

To succeed, companies across the energy sector must view procurement through a more strategic lens. In our experience, investing in structured processes, enabling capabilities and modern approaches to spend management are essential steps. Together they will deliver a more mature procurement function and unlock significant operational and financial value.



Mohamad Kaivan
Managing Director

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With so much investment on the line, procurement can't just be about support anymore, it has to lead.

The traditional playbook no longer works; procurement needs to think differently, act earlier, and extend its strategic reach beyond Tier 1 to truly manage today's complex and constrained supply chains.

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