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Strategic choices for midstream gas companies

Embracing Gas Portfolio @ Risk

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Strategic choices for midstream gas companies: Embracing Gas Portfolio @ Risk

The European gas market is undergoing radical change, a process that is catching midstream players in a classic strategic squeeze. What can they do about it? Midstreamers in emerging countries are building sizable sourcing portfolios to fuel their countries' economic growth. How should they think about building those portfolios?

European midstream gas companies are facing big dilemmas as their market evolves quickly in unpredictable directions, and they need to make strategic choices that will shape their fortunes. Similarly, many gas companies active in emerging countries (especially in Asia) need to make large sourcing decisions to satisfy the ever-increasing natural-gas needs of their growing economies. In both cases, there is a strong need for a much better understanding of the risk-return trade-offs on the choices they are making. In this working paper, we examine the business context for the industry and explain how it is shaping the choices firms must make. Later, we explain how a portfolio-based approach can help firms to make more sophisticated evaluations of their businesses. We will focus on Europe, because the evolution of its gas market over the last 30 years represents an excellent example of the strategic challenges that have emerged.

To understand how the gas market reached today's complex stage of development, we first focus on the power market. In the second half of the 1990s, Europe's power markets began a process of liberalization. Markets and prices became more transparent, and markets became more liquid and deep, with forward curves being traded for up to three years in the most advanced markets. In-house energy-management teams emerged to handle the complexities related to "generation portfolios," with associated costs indexed to commodities and to manage active sales activities to mass-market retail customers as well as to large industrial users.

Portfolios were optimized by looking from generation (and commodity sourcing) right through to the sales function and by assessing the return profile and its associated volatility. In effect, the business became one of sophisticated risk management of portfolio exposures on the sourcing and the sales side.

In the gas business, the so-called midstreamers have traditionally sat as intermediaries between upstream natural-gas companies (whose primary goal is to monetize their gas production) and the market (large industrial and power users and retail distributors). Until a few years ago, most gas prices were oil-linked. This was the norm for both upstream to midstream contracts, and for midstream-to-retail distributors' contracts. Risk management was relatively easy for the midstreamers because they could offset exposures on the sourcing side by taking opposing positions on the sell side.

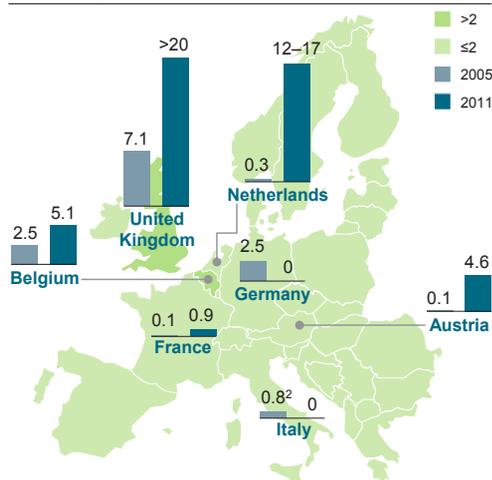
This traditional setting changed toward the end of the last decade. Starting in the United Kingdom and the Netherlands, markets started to become more liquid and oversupplied. Growing volumes have started to be priced away from the oil link and are determined instead by pure gas-supply dynamics. Furthermore, strong regulatory pressure emerged to make the gas market more liquid and deep, and price transparency was looked at as a key indicator of market efficiency (Exhibit 1).

The midstreamers' business model is now under severe pressure and will likely continue to be so in the near to midterm.

Two other market developments contributed to the outlines of the classic business squeeze facing Europe's midstreamers. Many of the long-term supply contracts signed by the midstreamers in the last decade assumed that demand in Europe would grow steadily. In reality, the onset of a severe economic recession has reduced demand. Further, midstreamers were not alone in failing to anticipate the strength and determination of governments to promote energy efficiency. They did, however, have significant exposure to the consequent fall in demand resulting from measures at both the residential level (for example, better insulation decreasing

Exhibit 1 Liquidity is increasing beyond major trading hubs, with European Union regulation aiming at further increases and more interconnectivity.

Liquidity at main European gas-trading hubs
Wholesale gas-trading multiples¹



Regulatory measures in the European Union aimed at further increasing liquidity and interconnectivity

- Overall, the **European Union promotes** the completion of a **fully functioning, interconnected internal energy market** by 2014
- One objective is to **improve physical-interconnection capacity** through several efforts:
 - enabling bidirectional capacity on all cross-border interconnectors
 - promoting additional infrastructure
 - ensuring nondiscriminatory third-party access
- The second objective is to **promote liquidity** by putting the **right market mechanisms** in place, for example, by taking the following actions:
 - ensuring offer of firm and interruptible capacities
 - enabling selling and reselling of unused capacity
 - forcing TSOs³ to offer unused capacity
 - implementing a use-it-or-lose-it mechanism

¹ Defined as wholesale-market trading volumes on final consumption; wholesale includes over-the-counter and exchange volumes for spot and derivatives products.

² 2006 value instead of 2005.

³ Transmission-system operators.

Source: Prospex; TSOs; McKinsey analysis

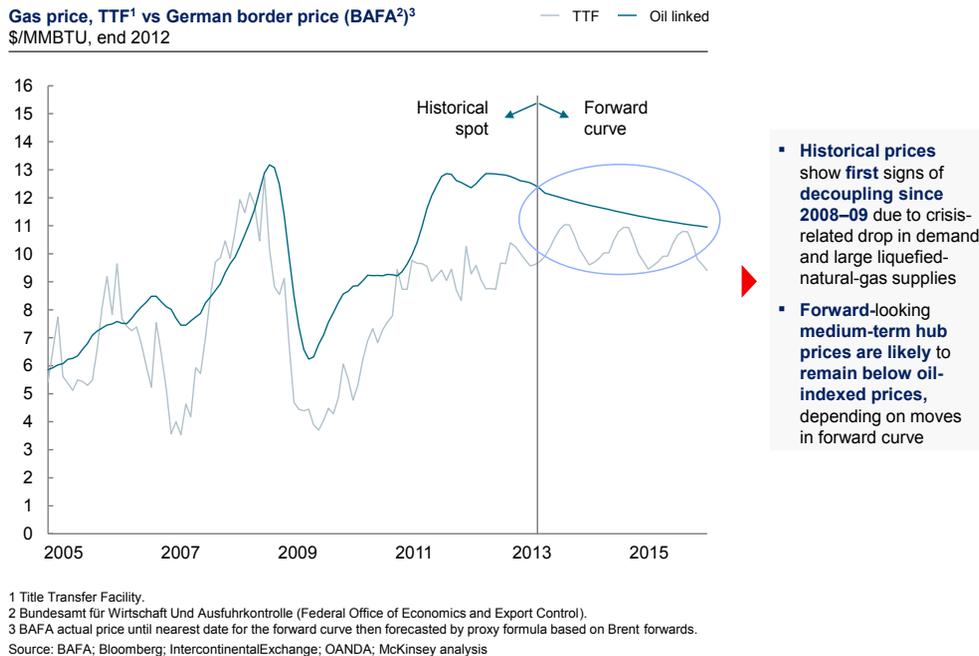
gas needs for heating) and the industrial level (such as more efficient production operations requiring less gas per volume produced). Both developments resulted in large volumes of otherwise unsold gas diverted to hubs.

In the meantime, gas markets across the European Union experienced momentum in achieving liquidity and providing wholesale price signals. Not only did the “hub price” (or the “gas to gas” price) develop its own behavior, breaking the link to oil prices, but it also settled at levels significantly below that of oil-linked supplies (Exhibit 2).

Some of the larger industrial users then quite naturally began to push their midstream suppliers to reduce prices to match the hub price. In some countries (for example, Germany), contracts between midstreamers and large industrial clients have started to include the option for industrial clients not to take volumes contracted with the midstreamers on a spot basis, replacing them by spot sourcing directly at the hubs. As an example, the option of sourcing gas from the hub has reduced the value of flexibility that midstreamers were able to offer, further increasing pressure on the profitability of their gas portfolios.

Finally, upstream firms have become formidable competitors to midstreamers. They have continued to increase their direct sales to hubs, and they have even fiercely embraced a vertical integration toward sales. Notable examples include the full acquisition by the Russian upstream giant Gazprom of German midstreamer Wingas, and the recent choice by the upstream players active in Shah Deniz of the Trans Adriatic Pipeline as the preferred route for their gas. Furthermore, many midstreamers launched contract-renewal negotiations with upstreamers. In these cases, midstreamers’ sourcing teams undertake complex analysis as they try to get the best deal. But they typically view each individual contract on a stand-alone basis, meaning they cannot see or understand the impact on the overall portfolio, which is made up of dozens of contracts on both the sourcing and sales sides.

Exhibit 2 A crisis-related drop in demand, coupled with large new liquefied-natural-gas supplies, led to decoupling between oil-indexed and hub-based prices.



The basic implication is that the way midstreamers have traditionally managed their portfolios is no longer fit for purpose and instead has exposed them to very strong risks and margin pressure. To make things even more complex, several midstreamers are actively reviewing their existing contract base, and many long-term contracts are coming to an end over the next few years; midstreamers must rethink the way they engineer their sourcing and portfolio strategy.

We can summarize midstreamers' dilemma as follows:

- They have a structurally long position in gas based on overoptimistic demand forecasts, a dilemma that is greater because they have huge sourcing portfolios built up over many years containing some very long-term agreements.
- They are heavily exposed to gas-pricing formulae that are expensive measured against emerging hub prices.
- The market is evolving so that it is increasingly easy for purchasers of end-use supplies to bypass them.
- Consumers and governments are more concerned with energy efficiency via, for example, better lighting, solar panels, and insulation.
- Industrial users have decreased their energy intensity either through energy-efficiency measures or by relocating their plants to low-cost countries, disrupting established supply lines.
- Big gas upstreamers have invested in their own sales operations and downstream capacity.

The strategic challenge: Optimize the gas portfolio

The strategic dilemma facing midstreamers is to determine how their business adds value. This is often addressed in an unsophisticated way, ignoring the options embedded in a typical midstreamer's portfolio, which leads either to its undervaluation or to a misunderstanding of the risk-return economics of the business. Options derive from the different characteristics of a sourcing portfolio: each contract has particular terms (in areas such as pricing and indexing formulae, volume options, delivery options, and flexibility terms) and these may lead to quite different "portfolio effects," depending on how they are combined and how they are monetized.

A related dilemma midstreamers face is determining how to get a better understanding of the potential upside of their portfolios. Companies already optimize their supply, but they tend to do this within the liquidity horizon for the commodity, usually not more than 18 months. Contracts and portfolios, however, have a much longer horizon to consider, where tools are more related with long-term strategic choices rather than short-term trading optimizations. For example, a company might conclude that it is very exposed both to the price of oil and to supplies from a specific geography. It would respond by offloading some risk to a third party, looking for downstream contracts that include oil indexation to balance the upstream exposures and thereby alter the risk profile. But how should the correct balance of these actions be measured? How should the impact they may have on the risk-return profile of the portfolio be measured?

Gas Portfolio @ Risk

The key for a midstreamer lies in understanding the long-term nature of its portfolio (from a commodity point of view as well as from an asset perspective) and then using sourcing-and-sales strategies to manage it favorably. For example, for some portfolios it can be more effective to increase the flexibility of the portfolio itself than simply to access cheaper gas with higher take or pay (TOP) or some destination clauses. But this is just one of the insights that can come from a systematic review of a midstreamer's portfolio.

In addition, midstreamers need to make sure that they include in their analysis the systematic evaluation of their assets (usually, long-term capacity agreements), including transmission pipelines, both domestic and interconnections; storage, both seasonal and short term; and liquefied-natural-gas (LNG) terminals.

In each case, there are complex options that need to be understood in order to determine on the one hand the additional value that an asset can give to a gas portfolio, and on the other hand the value of that asset (or capacity agreement) on a stand-alone basis.

The strategic challenge facing midstreamers is exacerbated because it is unclear how gas-pricing mechanisms might evolve in the future. As well as the determinants of basic gas-market economics, there are several key uncertain external influences on the future gas price. These include the production strategy of upstreamers, the evolution of the global LNG market, the completion of new planned import-and-transport gas infrastructure into Europe, and the regulatory push toward further market integration. In addition, technology, particularly the extraction of shale gas, will drive supply in unpredictable ways.

Midstreamers can improve their strategic management by incorporating scenarios in their analysis. We can illustrate the process of choosing scenarios by examining two simple potential scenarios and then explaining how these can support a risk-informed view of a midstreamer's portfolio. Under one mid- to long-term scenario, there could be a systemic delinking from oil prices as hub-based gas increasingly dominates. Alternatively, there could be a relinking of gas to oil and a restoration of long-term oil indexation. Before we address what assumptions midstreamers might make about how their business will perform in each scenario, let us explore them in turn (Exhibit 3).

Exhibit 3 We see two scenarios for the development of European gas contract terms over the next decade.

■ Full hub linkage
 ■ Majority hub linkage
 ■ Some hub linkage today/under negotiation
 ■ Little or no hub linkage

Scenario	Description	“What you need to believe”
<p>Full hub-based pricing</p> 	<ul style="list-style-type: none"> ▪ Northern Europe has full hub-based pricing with gas-on-gas competition (domestic vs Norway vs Russia vs LNG¹) ▪ Southern Europe shows increased hub volumes (eg, Italy and Baumgarten) ▪ Baltics, where fewer competing supply sources exist, is likely to have partial hub linkage 	<ul style="list-style-type: none"> ▪ Continuous pressure on supply/demand balance, eg, as a result of stagnating or declining demand ▪ Further push by the European Union (EU) to open and connect European gas markets ▪ Increased access to trading hubs, as a result of increased connectivity of markets (eg, infra, coupling) ▪ Further push in Southern Europe (eg, Italy) to create southern gas hubs ▪ Gas suppliers give in to buyers’ pressure to increase hub link in contracts and/or start to compete for volume instead of price
<p>Hub and oil index in parallel</p> 	<ul style="list-style-type: none"> ▪ Central European countries negotiate hub linkage in Norwegian and Russian contracts ▪ Spain, Portugal, Austria, Italy, Czech Republic/Slovakia gain some hub linkage ▪ Baltics and Southeast Europe fail to break oil link due to lack of competing supplies 	<ul style="list-style-type: none"> ▪ Constant or increasing gas demand ▪ Limited further success of the EU plan to push for integration of gas markets ▪ Limited additional transport infrastructure ▪ Stagnation or reduction in hub-trading activities ▪ Major gas suppliers and some European energy players limit gas-market openings and are able to keep status quo

1 Liquefied natural gas.

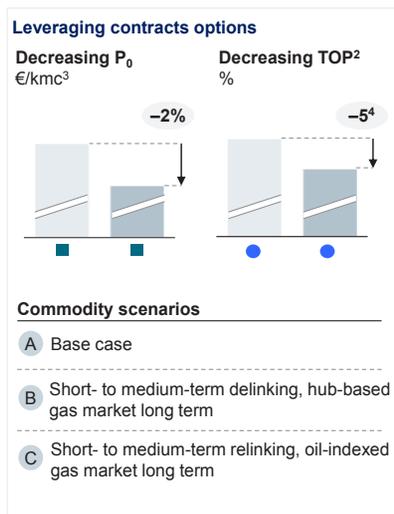
Each scenario leads to a different price-formation mechanism. In the first scenario, there is a full decoupling of the gas-hub price and oil-linked prices. The hub price is driven by the cost of prevailing marginal gas supplies, itself influenced by new upstream projects or new pipeline supplies. The anchor price of legacy oil-linked long-term contracts will be adjusted to follow the hub price.

In the second scenario, the gas-hub price forms a renewed link with the oil-indexed price, driven partly by price renegotiations. Once the link has been restored, the hub price fluctuates around the oil-linked price. The oil-linked price forms in reference to the cost of new pipeline gas, which is the marginal source of new gas into Europe.

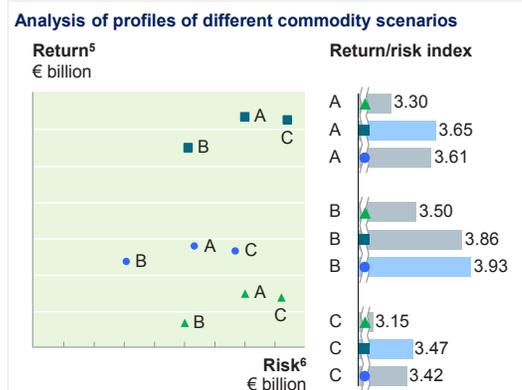
In theory, commodity scenarios can inform portfolio choices. By improving the transparency of the risk-return trade-offs in a portfolio, a midstreamer can look for opportunities to use the different levers they hold to change position. Exhibit 4 gives an example of how the same portfolio responds to three different scenarios, two of them the macro scenarios we described above.

The red triangles show a base case for a European midstreamer operating in a reasonably liquid market. We can see that this portfolio behaves best under scenario B, which is a version of our hub-based pricing scenario. Although absolute returns are slightly lower, the risk-adjusted returns are more attractive. At the simplest level, this might lead to a conversation about a firm’s risk appetite and the trade-offs it is willing to make. But we can go further. What would the same portfolio look like if we decreased the anchor price or we added flexibility to the portfolio by decreasing its TOP obligations? A lower anchor price increases profitability but does not alter the riskiness of the portfolio. Lowering TOP obligations, however, which is a proxy for flexibility, shifts the portfolio up and to the left—returns increase while risk is actually reduced. Furthermore, we can see that for scenario B, the decision to decrease TOP produces the best result, but this is not true for scenarios A and C; this shows that such analyses are not independent of a discussion around the chosen scenarios.

Exhibit 4 Results vary by scenarios.



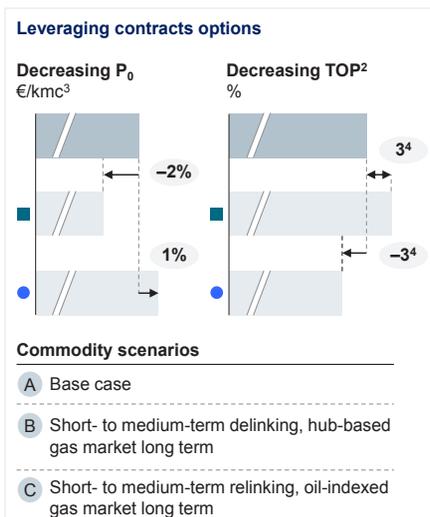
■ New portfolio with increasing P_0 ¹ ▲ Existing portfolio
● New portfolio with lower flexibility and decreased P_0 ■ Preferred



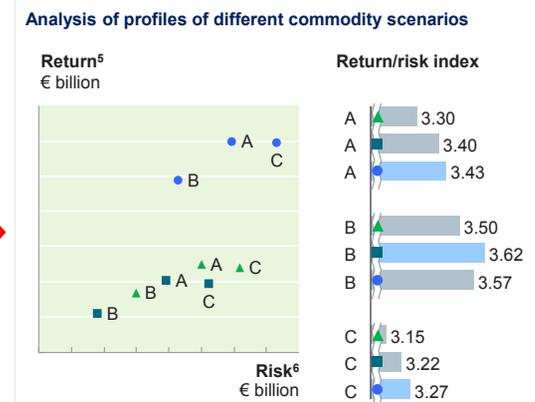
- The preferred option from a risk-return perspective varies by scenario
- Flexibility mitigates risk and generates return, while P_0 adjustment only affects absolute return and not its variance

1 Anchor price for gas-supply contracts.
 2 Take or pay.
 3 Thousands of cubic meters.
 4 Percentage points.
 5 Mean 10-year accumulated free cash flow.
 6 Difference of mean and 5th percentile of 10-year accumulated free cash flow.
 Source: Gas Portfolio @ Risk model

Exhibit 5 Combinations of decisions affect outcomes.



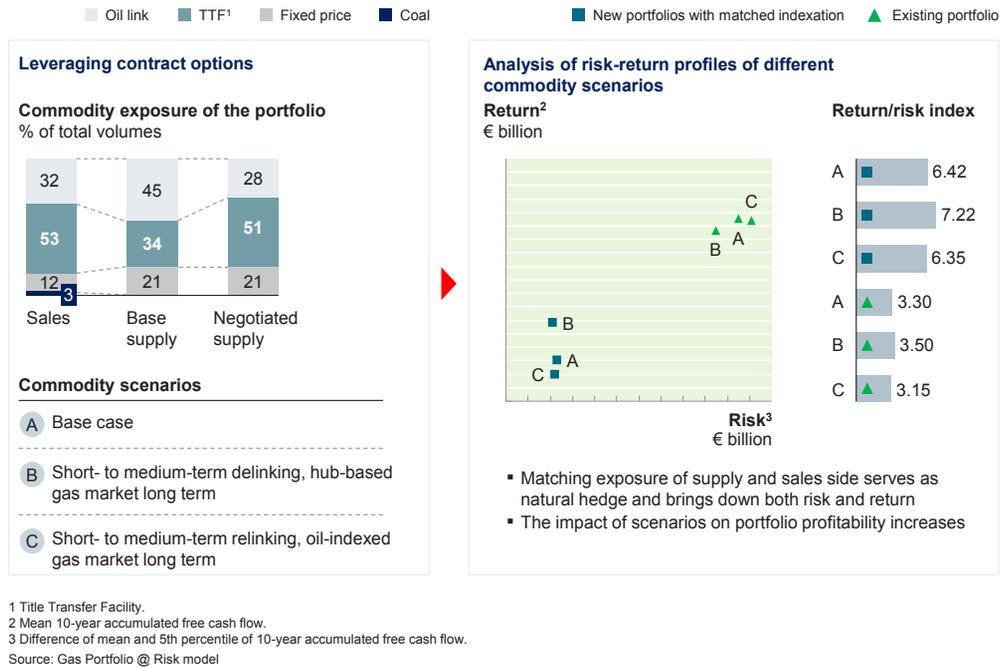
■ New portfolio with increasing P_0 ¹ and higher flexibility ▲ Existing portfolio
● New portfolio with lower flexibility and decreased P_0 ■ Preferred



- The preferred option from a risk-return perspective varies by scenario
- Flexibility mitigates risk and generates return, while P_0 adjustment only affects absolute return and not its variance

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 5 Mean 10-year accumulated free cash flow.
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 Source: Gas Portfolio @ Risk model

Exhibit 6 Indexation can be used to test portfolio behavior.



In the real world, choices rarely are binary. Exhibit 5 shows how a portfolio responds in different scenarios to a combination of decisions—in this case, a combination of lower anchor price and less portfolio flexibility (the dark-blue square) versus a higher price and more flexibility (the blue circle). Again, the analysis forces us to consider how much we believe each scenario. Scenario C implies a world in flux, in which case there is more value in the greater flexibility of the otherwise less attractive portfolio.

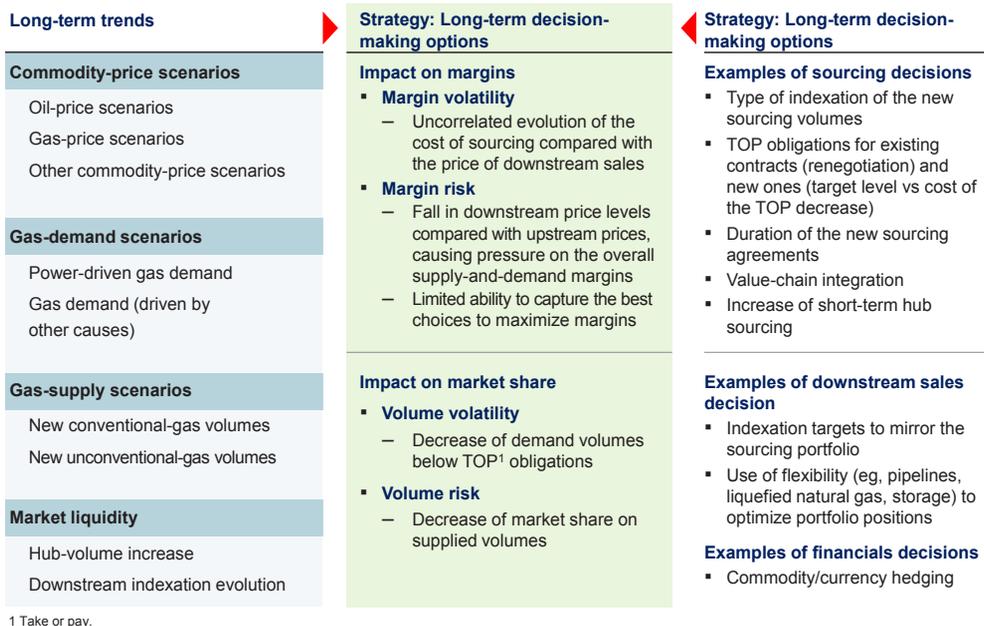
Finally, companies can use scenario analysis to investigate some of their fundamentals. In Exhibit 6, we show an example of how a review of indexation can be used to test portfolio behavior. In this case, the base supply is significantly exposed to the oil price. Tweaking the portfolio via new contracts can dramatically reduce the riskiness of the business by introducing natural hedges. But this comes at a price: lower overall profitability.

This is a good example of what is, in effect, a CEO-level decision around risk-return trade-offs. The hedged portfolios look quite like bonds, while the unhedged are like equities. If the firm wishes to find an optimal solution somewhere between the two, there is a combination that will match its chosen appetite.

Exhibit 7 summarizes the scenario set for a midstreamer. In addition to commodity prices, there are supply-and-demand scenarios for gas itself, and market-liquidity scenarios. Crucially, regulatory scenarios inform the latter two.

Exhibit 7 Gas portfolios are the result of long-term trends and strategic decision-making options.

ILLUSTRATIVE



The extent of the challenges facing midstreamers as the market continues to evolve requires these firms to develop a clear perspective and strategy to sustain their role in the value chain. Midstreamers need to design, and perhaps redefine, their value proposition if they are to succeed.

As we anticipated at the beginning of this paper, this is also true for the many gas companies that are active in emerging countries (especially in Asia) and that are taking large sourcing decisions to satisfy the increasing natural-gas needs of their growing economies. As they start to travel down the path that more advanced economies began to follow 20 to 30 years ago, it is fundamental that they ensure they are making risk-return-informed long-term decisions. They have one crucial advantage over their European forebears: today's technologies and analytics make possible what was simply impossible two or three decades ago.

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