

## Natural Gas in Flux

### Time to place bets and make business design choices

Fundamental changes are reshaping the natural gas marketplace in North America. Increased demand, fueled in large part by a fleet of new gas-fired electric generating plants, has driven prices well above historic norms. Higher prices, coupled with dwindling production from conventional fields, have brought unconventional gas and imported liquefied natural gas (LNG) into play. And with the collapse of Enron and the “asset light” energy merchant business design, many players see an opportunity to capture gas marketing profits.

These fundamental changes are creating business design opportunities and challenges in virtually every segment of the natural gas value chain. Industry players are responding and placing substantial bets, often involving long-lived assets, in the face of significant uncertainties.

Given finite organizational and financial resources, industry executives must carefully select their business design choices. To do so, they must answer some key questions:

- Which choices respond to evolving customer needs and provide goods or services for which customers will be willing to pay a premium?
- Which choices will most likely create strategic control to secure profitable relationships with customers?
- Which existing and emerging business designs will create the most sustainable value?
- Which are more likely to destroy value?

We see three segments of the natural gas value chain that are experiencing significant change and thus will challenge managers to develop successful business designs and growth strategies: LNG, storage, and marketing.

### Getting Liquified

The land rush is on in LNG. There is widespread agreement that LNG will play a more prominent role in meeting energy demand in the United States (see Exhibit 1). Projected demand will outstrip North American supply by a substantial and growing margin, and LNG will help bridge the gap. But there is less certainty concerning the volume of LNG that actually will land in North America and who will control the crucial links between world

markets and North American consumers.

Several questions stand out with respect to demand:

- Will North American demand for natural gas increase as projected over the next 20 years? Or will gas prices, which have been well above historic norms, help to kick-start investment in nuclear power and clean-coal technology, reducing projected LNG demand? How much demand destruction will occur in the industrial, commercial, and residential markets?
- Will instability in producing regions disrupt the development and operation of liquefaction facilities?

Exhibit 1 U.S. natural gas balance

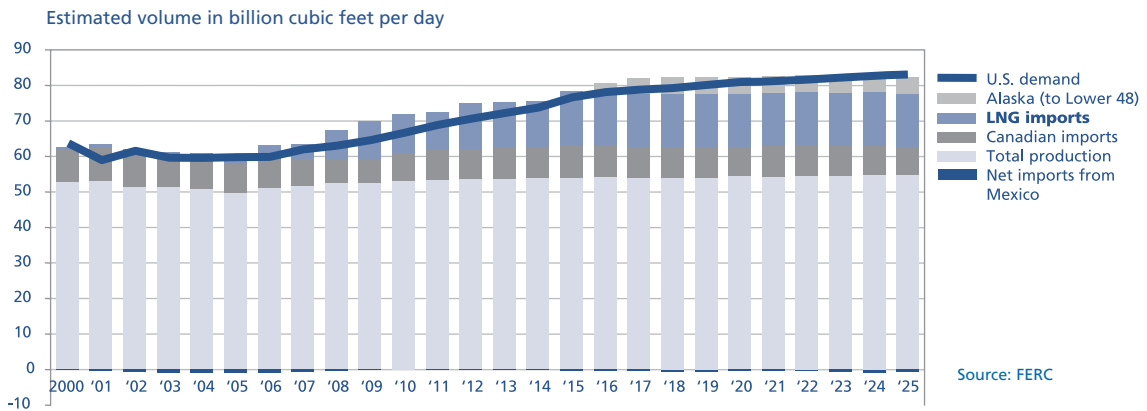
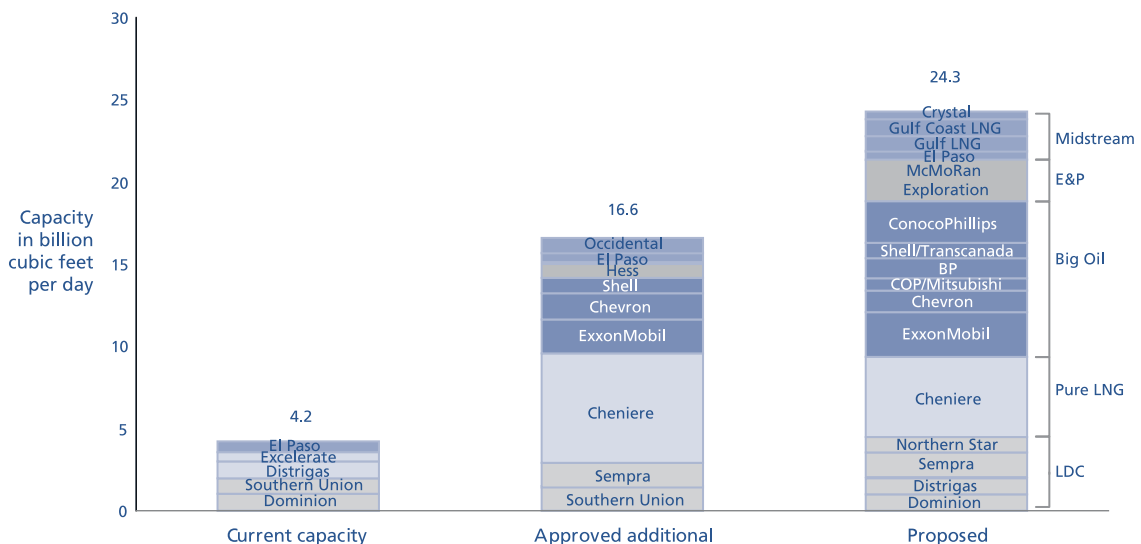


Exhibit 2 The rush to build LNG



- Will North American consumers find themselves outbid by European and Asian consumers for the output of limited liquefaction facilities?

As shown in Exhibit 2, players across the natural gas value chain are placing bets on LNG regasification facilities. The diversity of firms that own LNG terminals or are sponsoring proposed projects reflects the competing business designs evolving in this sector. But proposed projects would add capacity that exceeds total current natural gas consumption in the U.S. Clearly, many of these projects will not be built. Which players will realize the highest value from owning these assets and thus drive projects to fruition? We see three competing business designs that will steer the development of LNG terminals in North America (Exhibit 3):

**LNG as a link to new markets.** Major integrated oil firms have access to stranded gas reserves worldwide and the financial muscle to put costly supply chains in place. From a strategic viewpoint, they can sell into all of the major consuming markets worldwide and route gas to those offering the greatest profits. This strategy benefits from robust markets similar to the global market for crude oil, and North America currently offers the world’s most liquid market. However, regasification is the cheapest element of the

LNG supply chain and the segment with the lowest return on investment. North America has many players interested in supplying the facilities. In the long run, will the major integrated oil firms continue to deploy their capital in this segment, or will they be satisfied to leave the investment and operation to others?

**LNG as supply management.** Local distribution companies (LDCs) control relationships with industrial, commercial, and residential end-users, and often have divisions that generate electricity. As a result, they need to secure supply sufficient to meet their regulatory and contractual obligations at a cost that satisfies both markets and regulators.

From a strategic viewpoint, owning an LNG terminal within or near its service territory gives an LDC greater assurance of sufficient gas supply, a tool to better manage its supply sources and gain leverage with domestic suppliers, and an additional source of returns. However, as regulated entities LDCs are sensitive to political pressures that make locating LNG terminals difficult and time-consuming. If LDC management can convince shareholders and constituents that LNG terminals are important strategic tools, we will see continued investment, or at least agreements to lock up a portion of well-sited terminals’ capacity.

**LNG as a midstream play.** Midstream players, including LDCs with broader portfolios, see an

Exhibit 3 Competing business designs for LNG terminals

	LNG as a link to new markets	LNG as supply management	LNG as a midstream play
<b>Customer selection/ value proposition</b>	<ul style="list-style-type: none"> <li>• Markets where demand exceeds domestic supply</li> <li>• Monetize stranded gas</li> </ul>	<ul style="list-style-type: none"> <li>• Secure internal supply</li> <li>• Sell surplus capacity to third parties</li> </ul>	<ul style="list-style-type: none"> <li>• LDCs, marketers, and industrial customers</li> <li>• Provide infrastructure for Big Oil and other upstream firms</li> </ul>
<b>Value capture/profit model</b>	<ul style="list-style-type: none"> <li>• Capture spread between LNG costs and market prices</li> </ul>	<ul style="list-style-type: none"> <li>• Create leverage on domestic suppliers</li> <li>• Secure supply</li> </ul>	<ul style="list-style-type: none"> <li>• Long-term agreements with “take-or-pay” clauses; fixed fee structures ensure future revenues</li> </ul>
<b>Strategic control</b>	<ul style="list-style-type: none"> <li>• Access to low-cost natural gas reserves</li> <li>• Flexible scale</li> </ul>	<ul style="list-style-type: none"> <li>• Use majority of capacity for own purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Control midstream infrastructure required to get LNG to market</li> </ul>
<b>Company examples</b>	<ul style="list-style-type: none"> <li>• Chevron</li> <li>• BP</li> <li>• ExxonMobil</li> </ul>	<ul style="list-style-type: none"> <li>• Dominion</li> <li>• Sempra</li> </ul>	<ul style="list-style-type: none"> <li>• Cheniere</li> <li>• El Paso</li> <li>• Southern Union</li> </ul>

opportunity to own the import terminals that stand between world LNG markets and North American consumers. Such strategic links could provide relatively low-risk, fee-based income with no direct exposure to hydrocarbon price volatility, but financing the construction of such terminals generally requires take-or-pay contracts with creditworthy counterparties. To secure such contracts, midstream players must convince major integrated oil firms and LDCs that their value proposition is sufficiently attractive to outsource terminal ownership. In addition, the LNG infrastructure owned by midstream players could be susceptible to the overbuilding typical of a land rush, which would dampen projected margins for the fee-based services they hope to provide and potentially lead to a “no profit” zone.

Although one or more of these LNG business designs will likely be viable, competitors will need to move very quickly to secure a footprint in this space. LNG supply, viable sites, and pipeline/storage capacity are scarce, and some incumbents and early movers are expanding capacity aggressively to lock up regional markets. Companies investing in LNG will need to move quickly, have a compelling value proposition and perhaps the ability to weather short-term supply-demand imbalances.

### The Value of Storage

By 2020, North America will need another 650 to 700 billion cubic feet (bcf) of storage capacity. Much of this will be high deliverability, multi-cycle storage needed to help storage clients manage price volatility. With

Exhibit 4 Valuation of gas storage acquisitions

	2002 ScottishPower (PPM) acquires Katy storage facility	2003 Kinder Morgan acquires Mid-Tex Gas Storage Co.	2004 AGL Resources acquires Jefferson Island Storage	2005 Kinder Morgan acquires Texas Genco storage facility
<b>Storage type</b>	• Depleted reservoir	• Salt cavern	• Salt cavern	• Salt cavern
<b>Location</b>	• 20 miles from Houston	• 80 miles from Houston	• 8 miles from Henry Hub	• 40 miles from Houston
<b>Capacity</b>	• 21 bcf	• 5 bcf	• 7.1 bcf	• 4.2 bcf
<b>Acquisition value</b>	• \$180m	• \$17.5m for 32% interest	• \$90.3m	• \$100m
<b>Acquisition value/capacity (\$ million per billion cubic feet)</b>	▼ <b>\$8.6</b>	▼ <b>\$10.9</b>	▼ <b>\$12.7</b>	▼ <b>\$23.8</b>
	2005 Duke Energy Gas Transmission acquires Saltville Gas Storage and other assets	2005 Inergy Holdings LP acquires Stagecoach storage facility	2005 Plains All-American Pipeline and Vulcan Capital acquire Bluewater and Pine Prairie facilities	2006 Carlyle-Riverstone Global Energy and Power Fund acquires Encana facilities
<b>Storage type</b>	• Salt and depleted reservoir	• Depleted reservoir	• Depleted reservoir and salt cavern	• Depleted reservoir and salt cavern
<b>Location</b>	• 300 miles from Washington D.C.	• 150 miles from New York City	• Michigan, Louisiana	• Alabama, California, Oklahoma, Louisiana
<b>Capacity</b>	• 3.5 bcf	• 13.6 bcf	• 48.5 bcf	• 164 bcf
<b>Acquisition value</b>	• \$62m	• \$205m	• \$510m	• \$1.5b
<b>Acquisition value/capacity (\$ million per billion cubic feet)</b>	▼ <b>\$17.7</b>	▼ <b>\$15.1</b>	▼ <b>\$10.5</b>	▼ <b>\$9.1</b>

Note: All capacity figures are working gas. The ScottishPower transaction also included rights to four development projects. The Saltville transaction also included 77 miles of 8" pipeline. In the Stagecoach transaction, Inergy also purchased for \$25 million the rights to develop Phase II, a 13.5 bcf expansion then in the permitting stage. The Plains All-American/Vulcan transaction included \$250 million for the currently operating 24.5 bcf Bluewater storage facility and rights to complete the 24 bcf Pine Prairie Energy Center. The partnership said it will spend an additional \$260 million to complete Pine Prairie. The Carlyle-Riverstone transaction also included rights to the 27 bcf Starks, LA storage facility then in development.

Source: Oliver Wyman analysis

capacity already tight and limited ability to build new storage due to geologic and regulatory constraints, storage should have considerable value. Recent acquisitions appear to bear this out (Exhibit 4).

While LDCs and pipelines have dominated the storage sector, we foresee the growth of storage generating a new, standalone business design. LDCs and pipelines account for only about half of proposed new storage projects, with storage specialists and exploration and production (E&P) companies moving downstream proposing the remainder (Exhibit 5).

This new business design aims to take advantage of the growing importance of storage, given volatile demand and supply and the overall relative scarcity of storage capacity. This should lead to improved margins, more frequent additions and withdrawals, and even higher valuations. That said, it remains to be seen if the standalone storage business design can capture a significant space in the gas marketplace. Truly standalone operations can provide an attractive alternative to storage facility development and ownership for LDCs and pipelines. They also might simply become candidates for acquisition at prices attractive to storage facility investors (Exhibit 6).

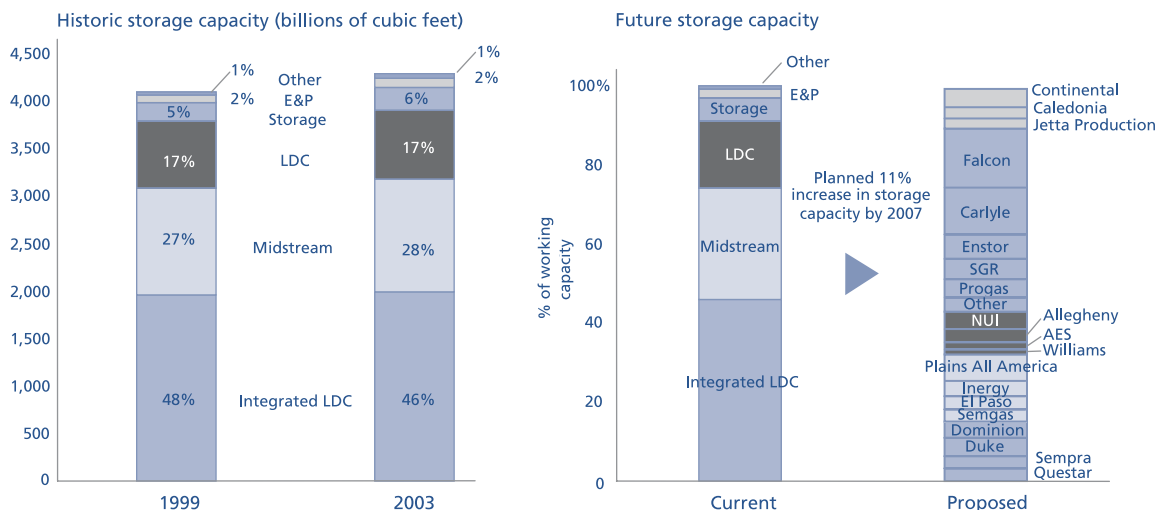
### The Changing Mix in Marketing

The collapse of the “asset light” energy merchant business model led in short order to a dramatic change in the way natural gas is marketed, with producers and, to a lesser extent, LDCs and financial parties gradually replacing traditional energy merchants (Exhibit 7).

In the third quarter of 2001, the volume of natural gas marketed peaked at 199.9 billion cubic feet per day (bcfd); by the third quarter of 2003, volume had bottomed out at 89 bcfd. Virtually all of this decline was driven by the energy merchant firms that had grown quickly during the 1990s leaving the business. Also during this period, integrated oil and other production companies grew and users (largely LDCs and independent power producers) shrank their marketing activities by nearly offsetting amounts.

Between the third quarter of 2003 and the first quarter of 2005, marketing activity rebounded by 27 bcfd, or roughly 30%. Approximately two-thirds of this growth came from producers and LDCs, and the volume of each now exceeds what it was in 2001. By the end of 2005, four of the five largest energy marketers were integrated oil companies and the fifth was an integrated LDC. The remaining third came from the emergence of a new class of players—invest-

Exhibit 5 Shift in storage growth

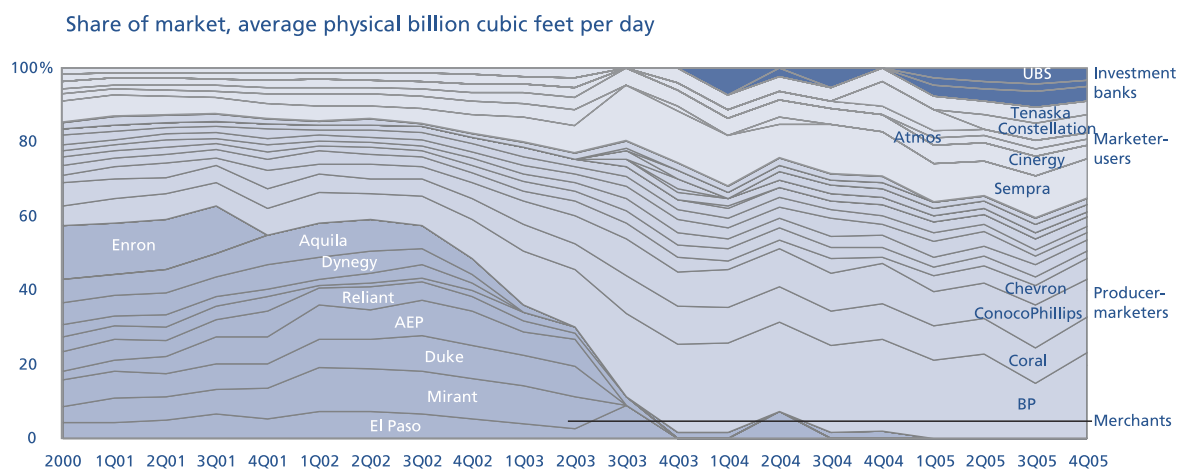


Source: Intelligence Press, Oliver Wyman analysis

## Exhibit 6 Competing business designs for storage

	Storage specialists	Midstream specialists	Supply managers (LDCs)
<b>Customer selection</b>	<ul style="list-style-type: none"> <li>Producers</li> <li>Marketers</li> <li>LDCs</li> <li>Pipelines</li> </ul>	<ul style="list-style-type: none"> <li>Producers</li> <li>Marketers</li> <li>End-users</li> </ul>	<ul style="list-style-type: none"> <li>Most storage space used for internal purposes</li> </ul>
<b>Value proposition</b>	<ul style="list-style-type: none"> <li>Provide high-deliverability, multi-cycle, and basic storage capabilities to third parties</li> </ul>	<ul style="list-style-type: none"> <li>Use storage to manage pipeline flows, sell surplus</li> </ul>	<ul style="list-style-type: none"> <li>Storage space leveraged to improve reliability of supply; limited third-party sales</li> </ul>
<b>Strategic control</b>	<ul style="list-style-type: none"> <li>Better access to HDMC facilities (came later to the game and generally have newer facilities)</li> </ul>	<ul style="list-style-type: none"> <li>Ability to offer customers pipeline service in addition to storage</li> <li>Significant existing storage capacity (scarce resource)</li> </ul>	<ul style="list-style-type: none"> <li>Significant existing storage capacity (scarce resource)</li> <li>Ability to extract full value out of storage space (internal use not impacted by regulatory limits on price)</li> </ul>
<b>Company examples</b>	<ul style="list-style-type: none"> <li>Falcon Storage</li> <li>Honeye Storage</li> <li>Red Lake Storage</li> </ul>	<ul style="list-style-type: none"> <li>Kinder Morgan</li> <li>Enterprise Products Partners</li> <li>Enbridge</li> </ul>	<ul style="list-style-type: none"> <li>Nicor</li> <li>Dominion</li> </ul>

## Exhibit 7 Who's marketing natural gas



Source: NGI's Daily Gas Price Index, company reports, Oliver Wyman analysis  
 Note: Volumes represent North American physical natural gas sales and exclude financial transactions.

ment banks and hedge funds with sophisticated marketing operations.

Producers and LDCs can gain value for their core business designs by actively participating in marketing. Producers ensure sources of demand, while LDCs do the same for sources of supply. Both can develop the right mix of long- and short-term contracts, manage risk exposure, and capture marketing profits when they are available. However, both suppliers and LDCs move outside their core competencies when they move into marketing, and so they must weigh risk and management focus when venturing into the marketing arena.

The wild card is new investment bank and hedge fund marketing operations. With higher levels of price volatility, demand for risk management capabilities and services has increased rapidly. Large financial players have taken advantage of this trend to establish a small but solid position in natural gas marketing. If key customers continue to value their expertise, these marketing operations may have an attractive value proposition—and their strong balance sheets, trading expertise, and market presence give them the ability to expand their marketing rapidly (Exhibit 8).

## Exhibit 8 Competing business designs for marketing

	Producer-marketers	LDCs	Risk management specialists
<b>Customer selection</b>	<ul style="list-style-type: none"> <li>• LDCs, other marketers</li> <li>• Acquired books after merchant marketer melt down</li> </ul>	<ul style="list-style-type: none"> <li>• LDCs and large industrial customers in adjacent markets</li> </ul>	<ul style="list-style-type: none"> <li>• Players seeking financial instruments</li> </ul>
<b>Value proposition/scope</b>	<ul style="list-style-type: none"> <li>• Physical and financial trading</li> </ul>	<ul style="list-style-type: none"> <li>• Focused on physical contracts</li> <li>• Link storage and midstream assets with marketing capabilities</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive risk management offerings</li> <li>• Focus almost entirely on financial trading</li> </ul>
<b>Strategic control</b>	<ul style="list-style-type: none"> <li>• Brand</li> <li>• Scale</li> <li>• Equity production provides secure supply</li> <li>• Expertise in marketing other forms of energy</li> </ul>	<ul style="list-style-type: none"> <li>• Customer relationships</li> <li>• Understanding of regional marketplace</li> <li>• Leverage storage assets</li> </ul>	<ul style="list-style-type: none"> <li>• One-stop shop for diverse financial needs</li> <li>• Risk management and trading expertise</li> <li>• Access to capital</li> </ul>
<b>Company examples</b>	<ul style="list-style-type: none"> <li>• BP</li> <li>• ConocoPhillips</li> <li>• Shell (Coral)</li> <li>• Chevron</li> <li>• Encana</li> </ul>	<ul style="list-style-type: none"> <li>• Sempra</li> <li>• Oneok</li> <li>• Atmos</li> <li>• Cinergy</li> <li>• Nexen</li> <li>• AGL Resources (Sequent)</li> </ul>	<ul style="list-style-type: none"> <li>• UBS</li> <li>• Merrill Lynch</li> <li>• Louis Dreyfus</li> <li>• Goldman</li> <li>• JPMorgan Chase</li> <li>• CSFB</li> </ul>

The operations of the energy merchant firms in the 1990s were incremental to existing marketing volume—they emerged, grew, collapsed, and disappeared, leaving the composite marketing volume of producers and LDCs largely unchanged. The challenge this time around will be to increase liquidity and more effectively manage risk without the transgressions and overreaching that drove the recent collapse.

### Strategic Moves to Consider

The natural gas marketplace is changing rapidly and fundamentally. Aggressive participants are developing their business designs with an eye toward the end game. Others waiting on the sidelines may be losing an opportunity to influence where value ultimately will be captured. Senior managers in the natural gas industry, therefore, should evaluate their businesses designs along several dimensions:

- How are customers' priorities and behaviors evolving? Are there products and services for which they will be willing to pay a premium? If so, how do we respond?

- Is our business design well positioned, given ongoing value chain changes? Where are the greatest opportunities to gain strategic control among our customer or value chain partners? Where are we most at risk?
- Where are direct and emerging competitors targeting our space with better business designs?
- What moves within our existing value chain segments, or into adjacent segments, can enhance our strategic leverage as well as bring additional sources of value capture?
- Where can partnerships improve leverage but keep capital risk low?

Assessing and responding to these key challenges will be critical to ensuring that a company's business design is well positioned to respond to the risks and uncertainties of the changing natural gas marketplace. ❖

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