McKinsey on Corporate & Investment Banking

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Smarter investing in **energy commodities**

Many arenas to profit from—but only with the right skills.

Panos N. Ninios and Scott Robinson

With oil climbing above $70 a barrel, energy commodities have become a hot space for investors. Once mainly the preserve of oil companies and the producers and marketers of natural gas and power, these commodities have joined other "exotic" asset classes in attracting investors who seek new ways to boost earnings. Investment banks, hedge funds, and private equity firms have taken advantage of the high volatility of commodity prices, caused by recent geopolitical events, natural disasters, and rising global demand.

Now these recent participants face a fresh set of challenges as they contemplate a maturing market and reexamine their original entry strategies. Will those entry points continue to provide a sustainable growth platform? Has the core business of risk intermediation for corporate customers become overly competitive? And will players be capable of building the necessary skills and fully exploiting synergies with existing business units (for instance, traditional structured products divisions and emerging markets)?

There are areas where investors can continue to profit. However, the most interesting opportunities will require them to bring broader skills and deeper knowledge to the table.

Who's doing what

Financial institutions have mostly positioned themselves around well-understood liquid-asset classes such as crude oil and natural gas. They have typically started in nonphysical over-the-counter (OTC) trades because they lack the infrastructure and knowledge needed for physical delivery. Most restrict themselves to the United States and, to a limited extent, Europe; few operate in Asia.

The particular strategies vary according to the type of institution.

Investment banks

Among banks, Goldman Sachs and Morgan Stanley have dominated the market in the trading of energy commodities over the past 20 years—and they have been highly profitable. Lately, both firms have earned gross margins in excess of a billion dollars a year, with roughly 60 percent of their margins coming from global crude and petroleum products and the remainder from electricity and natural gas. Such success, coupled with the void left in the wake of the merchant energy collapse in 2002, has attracted other banks to the business. From 2003 to 2005, the number of investment banks approved to trade wholesale power in the United States jumped to 18, from 6.

The banks have adopted various entry models, including organic growth, joint ventures with physical players, and full-scale acquisitions. A majority of investment banks have adopted a customer-focused model in which they assume balance sheet risks on behalf of their customers. The viability of these initiatives has depended on timing and on the ability of some investment banks to access specialized skills. Various models have been adopted including organic growth and joint ventures with more seasoned players. However, it's worth noting that significant joint ventures have failed in the past, and certain financial institutions have entered and exited the business several times.

Hedge funds

While only a handful of hedge funds were trading energy commodities in 2000, more than 300 have now adopted strategies, focusing on the liquid portion of the forward curves (notably in the power and gas markets). Much of the funds' expertise has come from teams and individuals who exited the merchant energy companies after 2002. Thanks to the participation of this new breed of player, the trading activity on the New York Mercantile Exchange (Nymex) in contracts such as crude oil, gasoline, natural gas, and cleared OTC products has increased by almost 40 percent. This group of participants has quickly become an important component of liquidity but, with the exception of a few players, has yet to develop the ability to participate in physical transactions.

Private equity firms

Finally, players with longer-term time horizons, such as private equity firms, are investing heavily in energy commodities by purchasing the underlying physical assets. These investments inject additional liquidity into the longer-term trading market, as the firms hedge their future cash flows in order to lock in an acceptable rate of return for their limited partners. The value of private equity transactions in this space has increased sixfold since 2002, reaching $7.8 billion in 2005.

Developing a competitive position

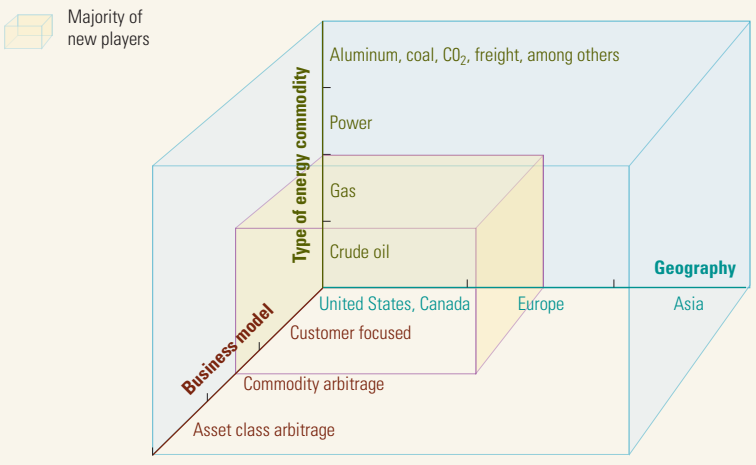
Financial institutions first need to understand their entry alternatives and growth opportunities across three dimensions to position themselves effectively in this rapidly evolving marketplace (Exhibit 1):

1 **Business model.** Essentially, investors can make money (a) by offering customers risk intermediation services, (b) through commodity or cross-commodity arbitrage, and (c) through asset class arbitrage. The latter entails arbitraging the equity (physical or financial), debt, or both of commodity-driven companies with the underlying commodities.

2 **Energy commodity type.** This dimension ranges from the larger and more liquid commodities such as crude

EXHIBIT 1

The strategic game box for the energy commodities market



oil and US natural gas to less liquid commodities such as power and carbon dioxide to downstream products of power, such as aluminum.

3 **Geography.** The geographic spectrum covers the mature markets of the United States, the evolving markets in other parts of North America and in Europe, and emerging markets primarily in Asia.

Up to now, most new participants have entered at the lower-left corner of the strategic game box, with more-seasoned players venturing along the different dimensions. In this way, new participants have been able to gain familiarity with the energy markets by participating in the most liquid and least complex areas. However, as these entry areas become crowded, their margins will continue to tighten, making them less attractive for all but the very-high-volume, scale-driven players.

Thinking *inside* the box

Over the next five years, winning institutions are likely to populate the least-crowded areas of the game box—power, coal, emissions, and freight, for example—which probably will represent the most profitable opportunities. It's possible for new entrants to leapfrog existing players. The challenge will be to find ways of building a competitive position while overcoming the associated execution risks.

Market participants will have to combine their existing skills (say, in project finance) and geographic coverage with a thorough understanding of the fundamentals driving supply and demand for physical commodities.

As businesses seek to position themselves in this space, several areas stand out as significant opportunities.

Power trading

Power trading reflects the consumption of other commodities—such as coal, gas, oil products, and emissions—thereby providing opportunities for cross-commodity as well as cross-asset arbitrage. It will therefore be a key growth area. According to the International Energy Agency, capital investment in the power sector during the next 15 years will probably reach some $4.7 trillion, equally split between countries that do and do not belong to the Organisation for Economic Co-operation and Development. The majority of the non-OECD capital expenditure will take place in China, India, and the Middle East. This is twice the level of investment expected for oil and gas combined.

Investment in new power generation capacity will differ according to geography (Exhibit 2). New and existing players should build their energy businesses accordingly—for example, focusing on coal trading and transportation in the United States and Asia and on gas and carbon dioxide trading in Europe. These different capital-investment profiles pose a clear management challenge for traders in the underlying investments. Customer responses, the maturity of markets, transport costs, and time horizons will all vary, so institutions will have to acquire and develop a variety of capabilities, people, and systems.

Asset arbitrage

At the moment, cross-asset arbitrage in the power sector is one of the least explored of all opportunities. A credible example of this sort of transaction comes from Texas Genco, which created $4.6 billion of value for investors in 16 months through a consortium of private equity firms (Exhibit 3). The consortium found value in the company by looking at the forward curve for gas and its implications for power prices in the Texas market—something many others missed. As

EXHIBIT 2

Plugging into different outlets

Power generation investment opportunities across geographies

Energy portfolio, tWh[1]

2005 Projected growth, 2005–20

	Europe		United States		China	
Renewable, eg, solar, wind	52	135	101	399	59[2]	103[2]
Hydropower	433	–1	317	–3	297	894
Coal	823	–62	1,903	858	1,605	2,239
Gas	710	926	560	136	N/A	N/A
Nuclear	904	–254	766	0	40	217
Other	40	–40	291	–72	N/A	N/A
Energy policy drivers	• Clean-power goals, expected to be delivered by gas • Unilateral CO_2 reduction leadership		• Push toward coal, with relatively soft constraints • Renewable support at state level		• Coal-powered GDP growth, but . . . • . . . government mandates for renewables[3]	

[1] Terawatt hour; 1 tWh = 1,000,000,000 kilowatt hours.
[2] Renewable plus 'other.'
[3] Renewable Energy Law, passed Feb 28, 2005, may boost renewable energy up to 10% of total generation capacity by 2020; this law's effects not assumed in modeling of status quo, given implementation uncertainties.

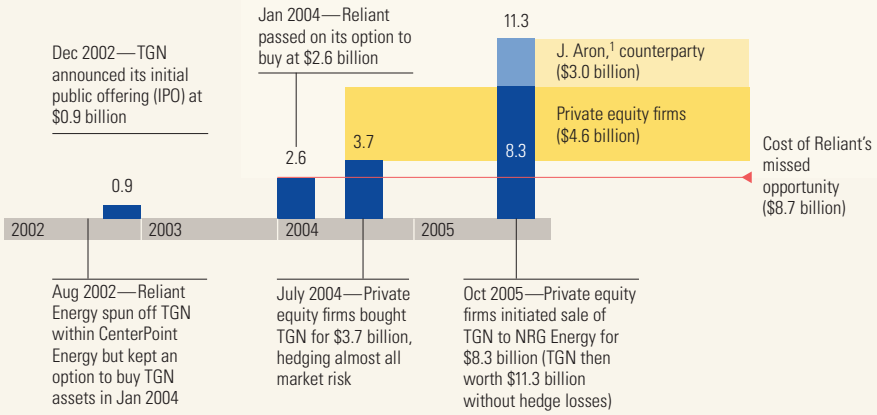
Source: Platts' UDI world electric power database; McKinsey analysis

EXHIBIT 3

Cross-asset arbitrage: The Texas Genco case

Texas Genco (TGN) market value, $ billions

TGN traded value
TGN transaction value



[1] J. Aron is the commodities division of Goldman Sachs.

Source: Goldman Sachs 2004 annual report; McKinsey analysis

a result, the private equity buyers acquired the assets ahead of the competition. Risk-management techniques enabled the buyers to increase their leverage by hedging the commodity exposure of the assets.

Debt arbitrage

An example of how investors can profit from commodity debt arbitrage comes from the recent history of the North American power producer Calpine, which as of spring 2005 carried $18 billion of debt on its balance sheet. A majority of Calpine's assets are exposed to gas and power prices in a variety of US power markets. As Exhibit 4 shows, in the spring of 2005 bankruptcy rumors sapped the value of Calpine's debt, which moved in tandem with the stock price even though the company's market commodity exposure and corresponding future cash flows remained virtually unchanged. Sure enough, after the rumors receded, Calpine's recourse debt returned to its previous par level, reflecting the fundamentals of the company's commodity position. Several savvy investors exploited this significant opportunity at the time—Exhibit 4 shows how the spark spread stayed relatively stable while the debt's value collapsed.

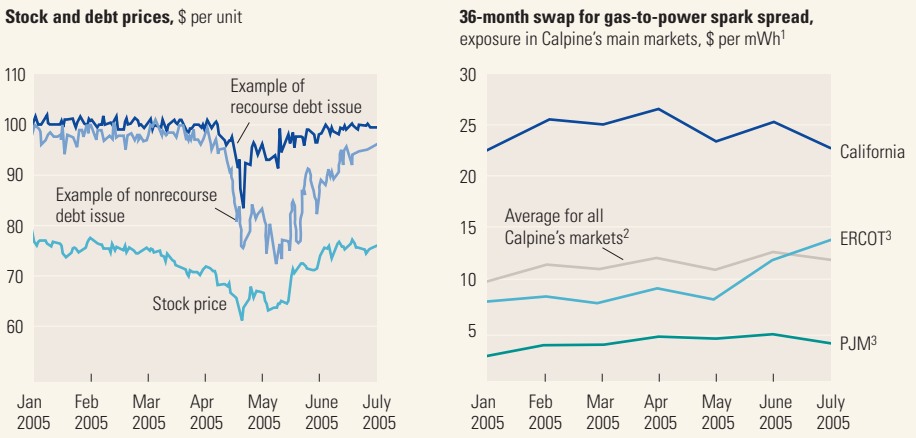
Analysis shows that the market frequently fails to value the commodity exposure of power companies appropriately, especially during times of market discontinuity. Arbitraging the capital structure of power companies by taking a commodity valuation and risk-management point of view can be very profitable.

Developing and acquiring the skills

Successful players will focus on broadening their skills, improving their lending capabilities, and increasing their knowledge of the energy companies' physical operations.

EXHIBIT 4

Commodities-debt arbitrage: The Calpine case



[1]Spark spread = spread between price of gas (at a specific conversion efficiency) and price of electricity; spark spreads are traded with specific conversion efficiency definitions in different markets; mWh = megawatt hour (1,000 kilowatt hours).
[2]Approximate price weighted for Calpine's exposure in each market (outside-in analysis).
[3]ERCOT = Electric Reliability Council of Texas; PJM = Pennsylvania–New Jersey–Maryland power grid.

Source: *Megawatt Daily*; New York Mercantile Exchange (Nymex); McKinsey analysis

Broader skills

Firms often miss many opportunities because no single group or desk has a broad enough vision or the complete set of execution capabilities needed to capture them. In contrast, successful players hire and develop talent with skills that span commodities transaction structuring, structured finance, corporate finance, the trading of physical commodities, and mid- and back-office operations. They also remove organizational barriers, such as individual profit-and-loss statements and compensation disincentives, which currently separate their debt, equity, and commodity businesses.

Better lending capabilities

In the late 1990s lenders rushed to take advantage of the lucrative opportunities to finance new power plant infrastructure. But many failed to develop the sort of processes, risk-assessment techniques, and management disciplines they were applying to their trading rooms. Losses ensued.

Given the volatility of commodities, banks must now think of their lending portfolios as commodity-trading positions, applying the same risk-management discipline and valuation techniques they would use in their trading businesses. Strengthening the links between project finance and commodities-trading teams can help banks avoid the distressed portfolios so visible during the last power business cycle.

Greater appreciation of the physical operations

Because many of the more sophisticated opportunities will involve the physical movement of commodities, access to expertise about assets and the ability to execute the delivery and receipt of physical commodities will be critical. Managing and accessing physical assets may involve nontrivial processes and systems, which could be developed in a proprietary way or through joint ventures with physical players.

Energy markets will continue to give financial players opportunities to take and intermediate risk. If executed properly, a variety of arbitrage opportunities could yield significant returns with limited risk taking. A company's ability to include more complex areas that offer a higher potential for profit will separate the winners from the rest. **MoCIB**

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