

MUSINGS FROM THE OIL PATCH

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Note: *Musings from the Oil Patch* reflects an eclectic collection of stories and analyses dealing with issues and developments within the energy industry that I feel have potentially significant implications for executives operating oilfield service companies. The newsletter currently anticipates a semi-monthly publishing schedule, but periodically the event and news flow may dictate a more frequent schedule. As always, I welcome your comments and observations. Allen Brooks

Short-Term/Long-Term: What's a Company to Do?

What oil price will choke off energy demand - \$60, \$70, \$80 or \$105 per barrel?

Two weeks ago we asked the question whether \$105 per barrel was the right price to substantially cut oil demand and help rebuild the world's surplus oil productive capacity. Our question was whether it was really \$80, \$70 or \$60 that would achieve the desired result. We thought it might even be in the \$50s. At the time we were writing that *Musings From the Oil Patch* (April 4), crude oil futures were climbing past \$57 per barrel, a new high, driven up by the Goldman Sachs \$105 oil price prediction. Today (April 18) as we write this article, the near month crude oil futures price dipped below \$50 per barrel briefly before rallying. This marks the second time in the past four trading days that the near month futures price fell below \$50 since exceeding the \$57 peak in mid February. In the two weeks since the peak price was attained, crude oil futures fell 12%. So what should one make of all this?

Wall Street is clearly worried – and taking its profits

With oil prices dropping like the proverbial rock, the energy glass quickly went from half-full to half-empty. Not surprisingly energy stock prices have been falling all through this commodity price correction. Wall Street is clearly worried – and taking its profits. If you are running an energy company should you be worried? In our view, little has changed. We have merely confirmed the truth that markets go up and markets go down. The long-term energy industry challenges have not changed. What has changed is the perception that the near-term industry “boom” times might not continue, or at least at the same pace as the stock market was suggesting.

U.S. economic growth is being marked down by forecasters, partly in response to evidence that current high oil prices are beginning to weaken consumer spending and corporate investment

The IMF said that the global economy could withstand an \$80 per barrel price

The Chinese may have begun to figure out how to purchase oil smarter than in past years

Once again the intersection of the long-term and short-term outlooks for energy is diverging.

What has changed in the short-term? The view that robust global economic activity in 2005 would drive oil consumption to levels where physical supply might be outstripped by the fourth quarter of the year is being doubted. The rate of U.S. economic growth is being marked down by forecasters, partly in response to evidence that current high oil prices are beginning to weaken consumer spending and corporate investment. The U.S. retail sales gain for March proved much weaker than anticipated. In addition, the April New York State Empire Index, a measure of manufacturing strength in the state, fell to a two-year low. In the past couple of weeks we have seen the International Energy Agency (IEA) lower its projection for global oil demand modestly (50,000 b/d), but it also stated that for the first time in two years the risk of energy demand revision was to the downside. This was after the IEA had been consistently revising demand forecasts higher virtually every month for the past fourteen months.

On Friday, the International Monetary Fund (IMF) released its 2005 World Economic Outlook in which it calls for the global economy to grow 0.7-0.8 percentage points slower in 2005-06 relative to 2004. This was a mild disappointment for observers. The IMF cites high energy prices as a contributing factor for this slower growth. What is interesting is that the IMF does not believe that oil prices are likely to weaken appreciably in the near future given the tightness of the global oil supply/demand balance. In an earlier, separate staff report, the IMF said that the global economy is not as threatened by high oil prices as it was in the 1970s, and that today's economy could withstand an \$80 per barrel price.

One of the issues the IEA pointed to for support of its increased demand revision risk was the modest 5.4% oil demand growth reported by China for the first two months of 2005 compared to last year's 20.5% increase. Interestingly, the IEA did not lower its current forecast for an 8% increase in China's oil consumption this year. Other energy forecasters have also seized on this slower year-over-year Chinese oil consumption growth as grounds for their forecasts that oil prices should fall from current levels as 2005 unfolds. While we expect crude oil prices to weaken at some point, we are not quite as comfortable in using the two months of weaker than expected Chinese demand to support this leap of faith to sharply lower oil prices.

It may just be that the Chinese, who are relying increasingly

By being a smarter buyer, China may be able to buy its oil cheaper, but to do that they will have to alter their buying patterns

on imported oil to satisfy their energy needs, have begun to figure out how to purchase oil smarter than in past years. By being a smarter buyer, China may be able to buy its oil cheaper, but to do that they will have to alter their buying patterns. In the oil tanker market, vessel charter rates, both spot and term, for the large crude haulers dropped dramatically during the first two months of this year. They came down from astronomical levels achieved in the fourth quarter of 2004 to more reasonable levels, but were still well above charter rates earned in the first quarter a year ago. While tanker rates were falling, the Chinese were absent from the chartering market. In mid-March, the Chinese returned to the tanker chartering market with a vengeance. Tanker charter rates began to climb and almost all spot charters from the Arabian Gulf and West Africa began heading east.

By waiting until tanker rates started collapsing earlier this year before entering the oil buying market, China may have been able to secure delivered oil slightly cheaper

Have the Chinese become smarter oil buyers? Traditionally, winter oil demand pushes up tanker rates during the fourth and first quarters of the year as additional crude is needed on a timely basis to meet winter heating demand. With the end of winter, oil demand drops to its lowest level during the second quarter, which leads to a weak tanker chartering market. Quite possibly the Chinese watched, and participated in, the historic pattern leading to more expensive delivered oil. By waiting until tanker rates started collapsing earlier this year before entering the oil buying market, China may have been able to secure delivered oil slightly cheaper than if they had continued their old buying pattern.

If we are right about the Chinese, then two trends should become evident in the near future that will support the long-term view of tight oil supply/demand conditions. First, China's oil demand growth rate will re-accelerate as more imported oil hits their shores. This will support the current healthy annual oil consumption growth forecasts. Second, oil import volumes to the U.S. may turn lower than projected, which could heightened concern over petroleum product inventory growth and, in turn, support higher crude oil prices.

The long-term outlook for oil markets continues to be driven by global energy demand and the pace at which global oil supply can grow

The long-term outlook for oil markets continues to be driven by global energy demand and the pace at which global oil supply can grow. ExxonMobil (XOM-NYSE) has a new advertisement entitled *Sharing more to use less*. The ad discusses the consumption patterns of developed and developing economies. It points out that economically developing economies now are using more total energy than that of all industrialized economies combined. That is not surprising since energy use is closely linked to economic

growth. Today, developing economies use 54 percent of total energy and are projected to use 63% by 2030. Developing economies' share of the world's carbon dioxide emission is also larger than that of developed economies. More important, their carbon dioxide emissions are rising at a faster pace.

China is projected to be have more than an 18-fold increase in vehicle ownership between 2002 and 2030

One of the reasons for this accelerating energy use and growing carbon dioxide emissions is the growth of the global automobile fleet. Contained in the IMF's new economic report is a table on global vehicle ownership projections. The projected growth in world automobile fleets is impressive with more than a doubling in vehicles over the 2002 to 2030 period. But more impressive is the growth in automobiles in China where there is projected to be more than an 18-fold increase over this period.

Exhibit 1. Vehicle Ownership Projections

	Millions of Vehicles				Per 1,000 People			
	2002	2010	2020	2030	2002	2010	2020	2030
World	751	939	1255	1660				
OECD	625	720	827	920				
United States	234	260	288	312	812	826	837	843
Germany	48	54	60	63	586	655	725	774
France	35	40	46	50	576	650	725	777
Italy	37	39	41	41	656	697	752	793
United Kingdom	31	37	44	50	515	616	711	771
Japan	76	87	95	96	599	682	753	796
Korea	14	22	31	36	293	442	610	718
Australia	12	15	18	19	632	715	778	812
Other OECD	137	164	205	252				
Non-OECD	126	219	429	741				
Africa	11	15	23	33				
Brazil	21	27	42	71	121	139	200	320
Other Latin America	12	19	33	54				
China	21	80	209	387	16	59	146	267
Other Asia	58	72	113	184				
Rest of World	4	6	8	11				

Source: United Nations Yearbook and IMF staff calculations

Note: Vehicles are defined according to the UN methodology: the Main components are motor cars seating less than eight persons, Trucks, buses and tractors

China uses more than six barrels and India nearly eight barrels to generate \$1,000 of economic activity

Energy efficiency is important. The U.S. currently uses the equivalent of three barrels of oil to produce \$1,000 of economic activity. Europe needs just over two barrels of oil to achieve the same GDP creation. However, China uses more than six barrels and India nearly eight barrels to generate equivalent economic activity. The reason China and India are more profligate in their energy consumption is that they have rapidly rising living standards and both countries' economies are on rapid growth trajectories. Will China's and India's economies become more energy efficient? Yes. The problem is no one can predict when that may occur. Long-term projections call for China to become the world's largest

economy by 2043, surpassing the U.S. At the same time, India will become the world's fourth largest economy. Achieving those rankings will require substantially more energy than these countries currently use, even if they become more energy efficient. That economic growth will continue to pressure global oil markets and commodity prices.

Winds of Change for the Offshore Industry

A Virginia State Senator details his efforts to get a bill passed to enable his state to opt out of the current Atlantic Coast offshore moratorium

Virginia State Senator Frank Wagner told attendees at the 2005 Annual Meeting of The National Ocean Industries Association in Washington, D.C., of his efforts to get a bill passed to enable his state to opt out of the current Atlantic Coast offshore moratorium. That moratorium has kept all Federal acreage offshore the East Coast off limits from oil company leasing for natural gas exploration and development activities since 1982. Recently, Sen. Wagner introduced Virginia Senate Bill 1054 that would direct the Virginia Liaison Office, which liaisons with the state's legislators and federal agencies, to lobby for an exemption for Virginia from the existing moratorium on offshore natural gas exploration and development activities. Sen. Wagner initially proposed that the state only push for seismic survey work to determine the attractiveness of the federal acreage off the Virginia coast, but his bill was ultimately expanded to include all offshore exploration and production activities.

NOIA attendees did not expect relief from the offshore moratorium to happen in their lifetime

The prospect of any East Coast state receiving an exemption from the Atlantic Coast moratorium had attendees gasping. For most, the realization that possibly the East Coast could once again be opened up for leasing and exploration activity was more than they could imagine. The phrase most often expressed by attendees was that they did not expect this to happen in their lifetimes.

The Gas Research Institute told Sen. Wagner that they estimate there may be as much as 30 Tcf of gas reserves located off the U.S. East Coast

Sen. Wagner was motivated to begin his Herculean efforts because he saw the negative impact energy shortages and high oil and gas prices were having on the Virginia economy. He cited the financial problems of a Honeywell (HON-NYSE) plant in Hopewell, Virginia. That plant, a large consumer of natural gas, had seen its fuel bill triple over the past five years. The financial impact of the fuel cost increase forced management to lay off 750 workers.

Sen. Wagner consulted with the Gas Research Institute (GRI) that told him they estimate there may be as much as 30 Tcf of gas reserves located off the U.S. East Coast that could certainly ease current high natural gas prices. Sen. Wagner

had the GRI come to Virginia to discuss its gas reserve outlook with state legislators. Following that meeting, Wagner's bill, and a similar bill in the Virginia House of Delegates, moved forward and were passed and forwarded to the governor for signature. Virginia Governor Mark R. Warner vetoed the bill, but primarily for procedural reasons and not substantive issues.

Sen. Wagner said that "the American public is looking for an energy solution."

The governor's contention was that the bill encroached on his role to direct the activities of the Virginia Liaison Office. He also believed that the law was inappropriate because it directs Virginia to advocate for federal legislation that had not yet been introduced. On the first point, Sen. Wagner said that the legislature directs the governor's office on various matters such as with regard to where to focus state spending when it enacts the annual budget. On the second point, he said there was nothing in the Senate bill beyond lobbying the appropriate federal legislative bodies to release the state from the moratorium and that does not require that legislation be enacted.

The prospect of offshore East Coast exploration presents an interesting challenge for the industry

In the NOIA presentation, Sen. Wagner made several observations that, if true, could mark a major turning point for the domestic oil and gas industry and the offshore oilfield service sector, in particular. Sen. Wagner said that "the American public is looking for an energy solution." He believes the public recognizes the magnitude of our energy problems and how they are contributing to high petroleum prices, which in turn is creating a negative impact on consumer budgets and employment opportunities. Sen. Wagner believes "Virginia sent a message" with the passage of his bill. Sen. Wagner said his next step is to approach the Virginia AFL-CIO leadership to discuss the energy situation and how it may be impacting the state's employment outlook, especially since the U.S. Navy is cutting back its presence in Virginia.

For many oilfield service company executives in attendance at the meeting, the prospect of an East Coast state proactively seeking an exemption from the Atlantic Coast moratorium because of perceived economic benefits was beyond belief. The moratorium is scheduled to expire in 2011, but almost everyone has expected an extension as a matter of course.

The prospect of offshore East Coast exploration presents an interesting challenge for the industry. The East Coast is a deepwater and potentially harsh drilling environment requiring third or higher generation semisubmersible drilling rigs or

An engineer involved in designing these sixth-generation rigs suggests their ultimate price tags will probably reach \$600 million

drillships. These types of rigs are currently in tight supply – a condition that is projected to continue for the next several years, or longer.

On Friday, Smedvig (SMV-A, NYSE) announced it had agreed to become a small investor in an effort with a Norwegian group, Eastern Drilling, to construct and operate a sixth-generation semisubmersible drilling rig to be available in early 2008 at an estimated cost of \$550 million. Maersk Drilling has flirted with ordering a fifth- or sixth-generation semisubmersible, but reportedly balked when the projected cost climbed above \$500 million. An engineer involved in designing these rigs suggests that the ultimate price tags will probably reach \$600 million. Capital costs of this magnitude will require both long-term contracts and day rates in the \$350,000 - \$400,000 range. When one uses the typical rule of thumb of doubling the rig rate to estimate the daily drilling cost, three-quarters of a million dollars a day will force oil companies to seek very high probability exploration targets, something that deepwater doesn't always provide.

Drilling company investment in new, expensive rigs might cause a negative shift in investor sentiment

Could Sen. Wagner's bill signal a political sea change for energy? Might it start a capital investment wave in the offshore drilling business? Opening up the U.S. East Coast might lead to a reduced U.S. dependence on imported energy. At the same time, new rig needs could become an investment outlet for the cash starting to build in offshore drillers' coffers. Rather than using this cash to pay dividends or buy back their stock, managers could use the funds to build new rigs and expand companies. That strategy change, however, might cause a negative shift in investor sentiment for energy stocks. The NOIA attendees who may have been moved to consider the upside possibilities of an opening of the East Coast maybe should perhaps be careful what they wish for.

World's First Offshore LNG Terminal Opens

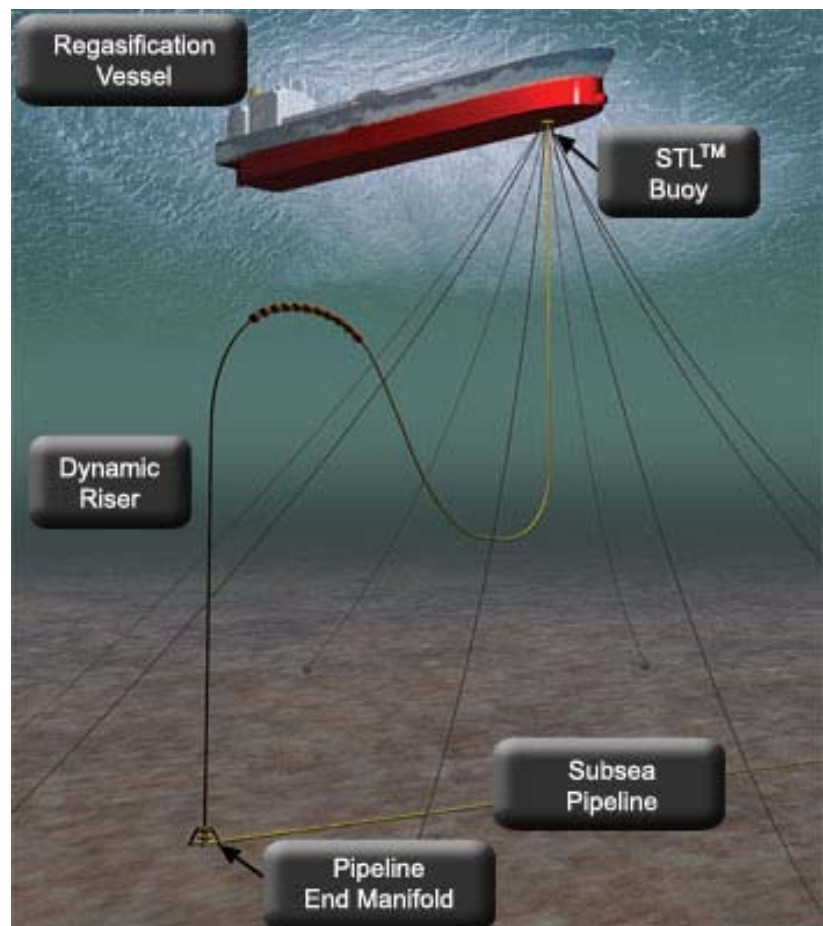
World's first offshore LNG terminal and first in U.S. in 20 years begins operations

Exceleerate Energy and Advanced Production and Loading (APL) inaugurated the Gulf Gateway Energy Bridge Terminal with the delivery of its first load of liquefied natural gas (LNG) recently. The terminal is the world's first offshore LNG terminal and it is located 116 miles offshore the Louisiana coast in the Gulf of Mexico. It is also the first terminal to be built in the United States in 20 years. The terminal utilizes APL's submerged turret loading (STL) system and a specially constructed LNG re-gasification vessel owned by Exceleerate Energy.

The STL buoy is anchored at the terminal location offshore and floats submerged, at a depth of approximately 100 feet, connected to a pipeline on the seabed by a flexible riser. When the LNG ship arrives, it connects to the terminal by pulling the STL buoy into the STL compartment of the ship where it is connected to the STL vessel system. The LNG is re-gasified onboard the vessel and passes through the STL system into the gas pipeline on the seabed and then on to the market. The only limitation of this terminal concept is that it requires specially designed LNG vessels that can connect with the STL buoy. This means the LNG supply will have to be dedicated to the terminal as spot LNG cargoes could not be unloaded.

Exhibit 2. Schematic of Offshore LNG Terminal

Schematic of offshore LNG terminal



Source: Exceleerate Energy web site

The success of the STL-based LNG terminal is being closely watched. There are a number of proposals for locating LNG receiving and re-gasification terminals along the East and

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West Coasts of the U.S. and in the Gulf of Mexico. Many of the terminal proposals are drawing community and environmental opposition. They are part of the challenge of delivering sufficient energy supplies where they are in greatest need.

Proposals to expand the existing LNG terminal in Providence, Rhode Island and build a new terminal at Fall River, Massachusetts have drawn objections from state and local officials besides community opposition

Besides LNG terminals, construction of wind farms also is being promoted as part of the energy shortage solution. However, some wind farm proposals are being challenged because of their visual and navigational impact on picturesque locations such as Nantucket Sound. The not-in-my-back-yard (NIMBY) movement is at work. For example, the proposals to expand an existing LNG terminal in Providence, Rhode Island and build a new terminal at Fall River, Massachusetts have drawn objections from state and local officials besides community opposition over the safety and environmental aspects, despite the fact there is an existing LNG terminal for meeting peak heating demand needs that requires 2,000 truckloads of the fuel every year merely to fill the existing storage tanks. Now, however, local and national Rhode Island officials are touting a proposed new offshore LNG terminal as a preferred alternative to these onshore projects. As Rhode Island U.S. Senator Lincoln Chafee, catering to his constituents, said, "Seems like the best hope is the new offshore proposal in Gloucester."

Tractebel LNG North America LLC, a subsidiary of the French energy company Tractebel, has proposed constructing a new LNG terminal that would be located offshore some 10 miles south of Gloucester, Massachusetts and 22 miles northeast of Boston. The \$900 million project would have a capacity to handle 400 million cubic feet per day of natural gas, enough to heat 1.5 million homes. However, even this proposal is drawing objections from the NIMBY crowd. One of the concerns is the potential impact on the nearby Cape Ann fishing grounds due to the tanker traffic associated with the terminal. Gloucester Mayor John Bell said, "It's just going to transfer the problem to another community. The ports should be working together, not working against each other."

China Buys Arabian Gulf Access Insurance

Chinese Prime Minister Wen Jiabao visited Pakistan in early April on a state visit and signed a number of agreements for economic, military and social projects. One of the agreements was for the deepening of Pakistan's Gwadar port in the

Pakistan's Gwadar port in the Balochistan province provides China with a strategic foothold in the Arabian Sea and the Indian Ocean

Balochistan province. The port provides China with a strategic foothold in the Arabian Sea and the Indian Ocean. This agreement has sent shivers through officials in Washington, Tokyo and New Delhi.

The idea of building a deepwater port had been studied by China and Pakistan since early 2001, but the impetus to move forward was the movement of U.S. troops into Afghanistan to hunt down al Qaeda terrorists. The project was located in the obscure fishing village of Gwadar in Pakistan's western province of Balochistan, bordering Afghanistan on the northwest and Iran to the southwest. Gwadar is nautically bounded by the Arabian Gulf in the west and Gulf of Oman in the southwest. The port also provides easy access to the Indian Ocean.

Exhibit 3. Pakistan

Pakistan is strategically located close to the Arabian Gulf, Iran and Afghanistan



Source: CIA

Securing deepwater facilities for China's navy to better protect the country's oil flow has become a high priority for the government

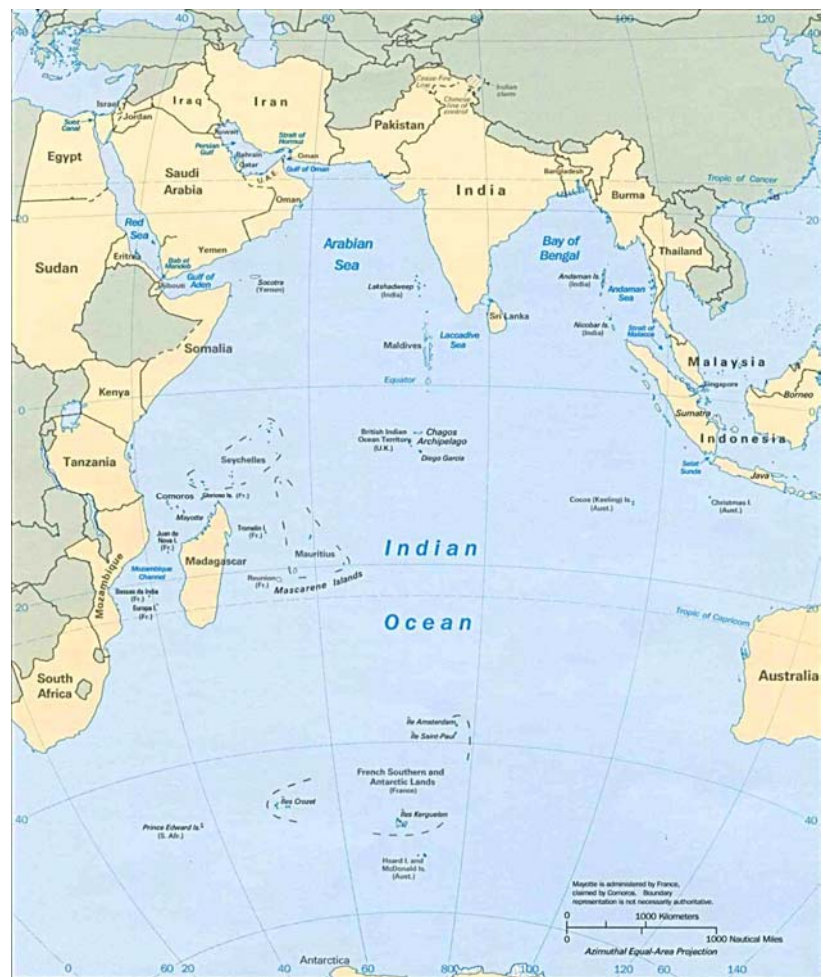
The port's recently completed first phase – three berths that can accommodate very large ships – is relatively insignificant. Phase two, however, will lead to the deepening of the port and the addition of nine berths and terminals. The port's strategic geographic location helps both China and Pakistan achieve goals that boost each country's military and economic status. China, which is growing in its dependence on imported oil and increased supplies from the Arabian Gulf, has become quite

concerned about the ability of some government to disrupt its oil supplies and help cripple the country's ability to defend itself. Securing deepwater facilities for China's navy to better protect the country's oil flow has become a high priority for the government.

Phase one of the Gwadar project also included the construction of a coastal highway from the port to Karachi, Pakistan. The Pakistan government is building highways in its northern provinces that will connect with towns in Afghanistan and in China's Muslim-majority Autonomous Region of Xinjiang. After Gwadar's phase two is complete, the ability of Chinese imports and exports to move through Pakistan will greatly improve. While there are no announced plans for construction of any oil pipelines from Gwadar to China, we should not rule out this possibility.

Exhibit 4. Strategic Location of Pakistan

The Chinese-Pakistani port project has Washington, Tokyo and New Delhi leaders nervous



Source: CIA

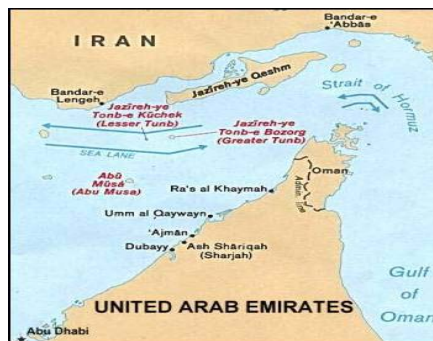
China increasingly will need naval power in the 2000s to protect the flow of its vital imports

The more important impact of the Gwadar expansion is the role the port could play in the development of the Chinese and Pakistani navies. For Pakistan, the port will help lift its navy to become a regional force that certainly has India nervous. For China, Gwadar will provide the country a deepwater facility close to the Arabian Gulf where it can monitor oil shipments and take action to prevent any military action that might disrupt its flow of imported oil. As the Dutch, Spanish and Portuguese needed colonies for refueling locations in the 1700s, the British Empire needed coaling stations for its navy in the 1800s and the U.S. needed bases around the globe in the 1900s, similarly China will need naval power in the 2000s to protect the flow of its vital economic imports.

A focus of industry and government concerns in the 1970s was the potential for a disruption of oil exports from the Arabian Gulf by blockage of the Straits of Hormuz. This narrow shipping channel that runs between Iran and Oman handles 40% of the world's crude oil. Should someone decide they want to create a severe economic, and political, event, the mere sink of a couple of VLCC tankers in the Straits would play havoc with global oil supplies. Gwadar's location could make China a player in protecting the Straits against attack.

Exhibit 5. Straits of Hormuz Critical to Middle East Oil Flow

The narrow Straits of Hormuz shipping channel that runs between Iran and Oman handles 40% of the world's crude oil



Source: CIA

The Gwadar project has not drawn much attention, except from strategic analysts considering the regional military balance impact. China's willingness, and need, to protect the flow of crude oil says a lot about the country's long-term energy challenges. China needs to diversify its sources of imported oil. Its needs more oil originating from regions other than the Arabian Gulf that has heightened China's interest in South America and Asia. The country's need for new pipelines to bring oil from Russia and Central Asia also will grow. Over time, the flow of global oil will shift from its current pattern, reducing somewhat the need for a rapid tanker fleet

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expansion. Additionally, the Chinese energy future we envision will perpetuate its pattern of seeking oil and gas resources globally with both a checkbook and geopolitical agreements.

Economists Less Concerned About High Oil Prices

Economists have changed their mind about the impact of high oil prices on the U.S. economy

In 2004, the Wall Street Journal Online's economic forecasting survey said a recession would follow if crude oil traded in the \$50 to \$59 per barrel range, exactly where futures prices have been trading since late February. The latest forecasting survey shows that economists have changed their mind about the impact of high oil prices on the U.S. economy. In the recent survey, 31% of the economists said oil would have to be sustained in the \$80-\$89 per barrel range to topple the economy. Almost half those surveyed, 48%, said it would take oil prices of \$90 per barrel or better to snuff out economic growth.

Exhibit 6. Economists Views of Oil Price Damage Points

Range	Aug-04	Apr-05
Less than \$50	0%	0%
\$50-59	36.7%	0%
\$60-69	30.6%	4.8%
\$70-79	16.3%	16.7%
\$80 or more	16.3%	31.0%
\$90 or more	--	47.6%

Source: The Wall Street Journal

The economists surveyed said they have used a \$47.46 per barrel price in their economic forecasting models. While all of this sounded fine a few weeks ago, the weak March retail sales figures released last week have to be causing some heartburn for economists about their oil price versus economic damage assumptions.

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