

Stranded Gas Hearings

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Alaska Gas Position in the Marketplace

Rick Harper, Consultant, Econ One Research, Inc., August 31, 2005

RICK HARPER, Consultant, Econ One Research, Inc., said he would be providing the committee with background information regarding how natural gas functions in the North American marketplace and how Alaskan gas is going to fit against that backdrop. He relayed that the natural gas industry is distinctly different from the crude oil products business – it functions differently, the infrastructure is different, the nature of the product is different – and as the state becomes a major force in the production and delivery of natural gas in North America, [the legislature] will come to understand those distinctions, which he characterized as important particularly from an analytical perspective. He offered his belief that the legislature is aware that a lot has been going on in the energy marketplace in general and in the natural gas marketplace specifically. Prices have been rising to unprecedented levels, resulting in unexpected market responses, but in the past, for a long period of time, the natural gas industry was price regulated at the point of production.

MR. HARPER said that after the price of natural gas stopped being regulated and natural gas prices took off, there was a tremendous boom in drilling. But when those supplies came on, prices collapsed and the upstream industry in North America suffered tremendously. Currently, the situation is much different in that there has been a terrific price run-up, though that could simply be a technical adjustment to the unrealistically low prices seen in the 1990s. There has been a modest increase in drilling, but there hasn't been the same kind of demand moderation that was seen in the 1980s. In the 1980s immediate fuel switching occurred on the part of industrials, but today, the industrial segment of the business doesn't occupy as big a part of the market share in total, fuel switching capability is not in place, and crude oil prices and product prices are also high. Therefore, to some extent, demand has been trending upward.

MR. HARPER relayed that crude oil is a very fungible product, capable of being transported in a number of ways or simply stored. The pricing structures, the regulatory structures, and the commercial structures are reflective of those fundamental physical characteristics. Natural gas, however, is very different. Natural gas can only be moved through a pipeline, and although the means of dealing with natural gas is changing due in part to advances in technology, natural gas is still very distinct from oil in that regard. Referring to a map illustrating the natural gas pipelines in North America, he remarked that it shows a "highway system," and that the natural gas market in the United States is made up of a collection of physically regional markets. Characterizing what has been occurring in the natural gas pipeline industry in recent years as nothing too different from what has been occurring in the "producing side of the business internationally," he said there has been a lot of consolidation of ownership, particularly of interstate pipelines in the U.S.

MR. HARPER reminded members that in the U.S., there are two categories of natural gas pipeline – intrastate pipelines and interstate pipelines – and, again referring to the aforementioned map, pointed out that there are concentrations of pipelines and producing areas and that there are orientations to specific markets – for example, Gulf of Mexico and Gulf Coast production serves Eastern and Midwestern markets, and Western Canada [production] predominately serves the West Coast and to some extent the Midwest. Ownership of natural gas pipelines has traditionally been much different than ownership of crude oil pipelines, he relayed, adding that although he is not aware of any U.S.-based producer owning an interstate pipeline, they routinely "subscribe" to pipeline capacity as a part of their marketing and trading operations. One of the reasons for avoiding ownership of interstate natural gas pipelines, he surmised, could be because of the perception that the Federal Power Commission and its successor, the Federal Energy Regulatory Commission (FERC), might seek to encumber [a producer's] upstream activities with regulated rates of return.

MR. HARPER suggested that another reason could be because of the perception that regulated rates of return are not desirable, particularly given what [a producer] perceives as its other investment

alternatives. He went on to relay that in the last 10 years or so, there has been a lot of pipeline construction in North America, and surmised that this is both a consequence of rising demand and a byproduct of the deregulation that occurred in the 1980s and early 1990s. Basically, a lot of the investment made in the 1990s was intended to better interstate markets, to improve supply access, because the basis for buying and selling gas had changed dramatically. Construction has abated a bit in the last three or four years, he noted, adding that most new construction is aimed at connecting new supplies in new basins, particularly in "Deepwater Gulf of Mexico," in Wyoming, and in the Barnett Shale in north Texas. A lot of the "de-bottlenecking" that needed to be done in the marketplace has been done, basically.

MR. HARPER remarked that although natural gas is a less fungible product, one must remember that crude oil has to be converted into other energy forms before it's usable, whereas natural gas can be used from the time it is produced and conditioned, and it can be delivered directly to homes and factories, which is not true of crude oil. Because natural gas has traditionally had a very big role in heating and heating-related utilizations, it's a very seasonal business in terms of its utilizations, physically, and, as it has become increasingly traded as a commodity, those utilization characteristics are reflected in the commodity and financial markets. The business, he explained, operates in two or three different dimensions. There is the physical market in which the product is purchased [for use by] electric utilities, industrials, and local distribution companies, for example. There is also a "paper" or financial market; natural gas is traded on the New York Mercantile Exchange (NYMEX), and, over the last decade, has been the most volatile commodity traded.

MR. HARPER said that natural gas prices are now pushing \$13/mmBtu (million British thermal unit), \$1 of which is a reflection of what has occurred because of Hurricane Katrina. He opined that the current price levels are not sustainable, but acknowledged that there has been major structural realignment in North American energy pricing, particularly with regard to natural gas. He characterized this as a huge shift upwards in the "range of uncertainty." Although what occurred in the 1990s created a lot of fear about producing natural gas, this fear is slowly abating and "a steady march upward" [in pricing] can be perceived. Looking forward, however, he said that one can see a different profile, and pointed out that although the NYMEX is primarily a financial market with over 95 percent of its trades never going to physical delivery, it does act as a price discovery mechanism in terms of setting cash prices for the physical market. So there is an expectation that prices will be substantially above what they have been in recent times. Additionally, prices are higher in winter than they are in summer because, unlike crude oil, natural gas is not produced "flat out year around." Instead, natural gas "cycles" with production in the summer being less than half of what it is in the winter.

MR. HARPER relayed that nontraditional supplies are going to play an increasing role in the North American natural gas industry. Historically, the vast majority of U.S.-consumed [natural] gas was produced in the U.S., but Canadian imports have taken on an increasing role, currently representing approximately 14 percent of U.S. consumption. The liquefied natural gas (LNG) business has been around a long time; there are approximately 100 LNG facilities in the U.S., most of which are associated with local distribution companies that use "it" as a means of storing natural gas for "winter-peaking" needs. Currently, there are four active LNG terminals in the U.S. and over 35 proposed projects. So there are a lot of shifts, he remarked, adding his belief that the time is right for the consideration of Alaskan natural gas and [Canadian] "frontier" natural gas.

MR. HARPER explained that natural gas's physical markets trade regionally and tend to operate around physical hubs, which are financially connected and include the Henry Hub in Louisiana – the point of physical delivery for any NYMEX contracts or trades that actually go to delivery; the Chicago Hub – which is important in terms of both its consumption position and its interstate position; and the AECO Hub in Alberta, Canada – which has become very important from a "basis" standpoint. With regard to the term, "basis," he explained that because natural gas is not fungible, and therefore cannot be moved easily to points where prices are higher, a phenomenon called "basis trading" has occurred. So not only does natural gas trade on the physical market and on the financial market, the difference in location also trades. He elaborated:

In other words, if natural gas at the Canadian Border in British Columbia – a place called Sumas – could be \$1 lower than [the] NYMEX one month, it could be \$.50 lower the next month. That's called a "basis" or a "basis differential." And "basis" actually trades and trades very actively, and basis is even more volatile than the financial products – the commodity markets.

MR. HARPER then referred to a chart, which he said illustrates the basis differentials on August 22, 2005.

CHAIR THERRIAULT asked whether basis is a differential for delivery.

MR. HARPER said no, adding that basis is just what the market believes the relative value of natural gas is at different locations. He mentioned that the AECO Hub is not a specific location; rather gas at the AECO Hub is simply gas that is "moving" – or being traded – on the [Nova Inventory Transfer (NIT)] pipeline system in Alberta. Again, basis is another word for location; because one can't physically bounce gas between locations, a basis differential has become a product that is traded. He then mentioned the term "load factor," describing it as how much capacity is utilized on an average basis over some period. Econ One's expectation, he remarked, is that Alaskan [natural] gas will be "base loaded" into the market, which he said means [the gas] will "move" everyday, adding that the decision regarding whether a supply of gas is base loaded or not has to do with "what happens if you don't produce [a thousand cubic feet (Mcf)] a day – when is that Mcf produced."

MR. HARPER said that in typical Gulf Coast, Gulf of Mexico, reservoirs, an Mcf that's not produced today might be produced 3 or 4 years from now. However in "coal seam" production or tight sand production – like the Barnett Shale in north Texas – an Mcf that's not produced today may not be produced for 30 years, and such may be the case in Alaska. This type of information can help determine, from an economic standpoint, what makes sense to sell now, and what makes sense to have stay off the market during non-peak periods. He went on to say:

Traditionally, LNG has been base loaded, but I think increasingly LNG is going to ... come to be recognized in a much different way in U.S. markets, particularly foreign LNG, because it is the one fungible aspect of the natural gas business. ... You can take a cargo that's en route from "Trinidad Tobago," which is our largest supplier of LNG today, and you can divert it en route, and you can't do that in the pipeline business. So it gives you physical ... [options], it gives you financial ... [options], and so increasingly I think we will see LNG operate in a very flexible fashion.

MR. HARPER said that basis shifts will always occur when there are pipeline and supply additions because the relative value between locations changes; for example, if Alaskan North Slope gas is delivered to Chicago, the difference in the price between the Chicago Hub and the Henry Hub will change. Changes in basis will also occur over time as additional adjustments in the marketplace occur. He then pointed out that particularly in the western sedimentary basin in Canada, as time has gone on, drilling in the region has moved westward and northward, and as a result, "increasingly lean" natural gas has been discovered. Natural gas in its native state often has other usable products in it – ethane, butane, propane, and other components. Such products exist in Alaskan [natural] gas. To the extent that Alaskan natural gas moves into Alberta, that will be a very positive thing because of the investments that have been made in that location, investments both in processing and in the utilization of feedstock, particularly ethane and propane.

SENATOR FRED DYSON, Alaska State Legislature, offered his understanding that Econ One, by speaking about moving gas through Canada, is then operating under the assumption that Alaskan [natural] gas will enter into the mid-continental market rather than into other available markets.

MR. HARPER disagreed, and clarified that he is merely discussing possible outcomes under various scenarios, and noted that Alaska is not on the "pipeline" map he's been referring to because currently Alaska doesn't have an interstate pipeline for natural gas. He pointed out that on that map, Canada and the U.S. are not differentiated in any significant way, and surmised that this is due to the fact that [the pipeline systems of the two countries] function as a completely integrated infrastructure and are integrated commercially. The regulations promulgated by the NEB and by the "Alberta commission"

remarkably mirror those in the U.S., and therefore "things" function on an interchangeable basis. Those that trade the business know no borders and simply consider there to be a North American market, he remarked, although that has not always been the case.

MR. HARPER, on the issue of foreign LNG, said that currently, approximately 800 billion cubic feet (Bcf) of natural gas is imported through four terminals, and [this amount] is expected to double over the next five years. He assured the committee that from a market perspective, foreign LNG and Alaskan [natural] gas – whether delivered via a pipeline as LNG – are not competing because they fill different niches in the market. He noted that the largest of the four foreign LNG terminals is in Lake Charles, Louisiana, and that about 100 percent of the LNG supplies at that terminal are "spot" rather than "long-term contracts." MR. HARPER, in response to a question, offered his belief that the market has room and the need for both Alaskan natural gas – in any form – and foreign LNG. However, should Alaskan natural gas be converted into LNG, then its points of entry [into the market] would come into play as a determining factor in certain decisions. With regard to the question of who will buy Alaskan [natural] gas, he noted that the market currently [requires] around 23 trillion cubic feet (Tcf) and is expected to [require] more. Those that would be interested in Alaskan [natural] gas include those that generate electricity – either for utility purposes or otherwise – and local distribution companies. With the collapse of Enron [Corporation] and other events, the "mid-stream part of the business" has eroded substantially, though this should reverse, he opined, thereby opening the door for existing trading houses and emerging "mid-stream" [entities] to play a very active role in purchasing Alaskan [natural] gas.

MR. HARPER mentioned that foreign LNG projects and North Slope production-related projects have similar pricing concerns because of the long lead time required for large capital investments; the two types of projects also engender similar thoughts among those that view them from a market perspective, a financial perspective. Those that give consideration to the financial derivative products of one are also giving consideration to the financial derivative products of the other. There are a whole host of financial products in the natural gas business that allow one to manage price risks separate and apart from the commodity itself; for example, one can buy "puts" and "calls" for natural gas similar to what can be bought for stocks, and those products can in turn be used to create "collars." He went on to describe a "costless collar" as [a product] in which the price for selling and the price for buying are limited to an agreed-upon amount.

MR. HARPER said that of issue in the natural gas business is "forward liquidity," since the market doesn't trade actively on the NYMEX on the "out years," although [the market] is extremely active "two or three years out." He added, "People lock in positions, but they don't tend to lock in long-term positions; that's typically done in the over-the-counter market." He offered his understanding that there are costless collars currently being traded, for the period of 2010 to 2015, on the order of \$5.75 on the downside and \$8.50 on the upside. He pointed out that in noting that those kinds of deals are being made, he is not saying that the state should do something similar, rather he is merely making members aware that such things are occurring.

MR. HARPER opined that the timing for having [Alaskan natural gas] enter the market is excellent, and that such a product would be a logical addition to the marketplace as it would not be competing on a mutually exclusive basis with any other supply project of which he is aware. There has been a pricing structural uplift and there is adequate pricing support, he concluded.

REPRESENTATIVE SAMUELS asked whether the aforementioned seasonality would affect an Alaskan pipeline project.

MR. HARPER said no, adding his belief that it only makes sense for [Alaskan natural gas] to be physically base loaded into the market.

MR. HARPER, in response to a question, offered his belief that traditionally producers have not been eager to own interstate gas pipelines primarily because of concerns regarding the FERC and the possible regulations it might institute, particularly since natural gas, due to its lack of fungibility, is hauled on a

contract basis through pipelines for the most part and thus is generally much more heavily regulated by the FERC than crude oil.

CHAIR THERRIAULT asked whether users of [natural gas] would want to lock into a long-term price, or whether they are moving "to more of a short-term contract pricing."

MR. HARPER indicated that although such users and local distribution companies are interested in and concerned about secure, long-term supplies, they are also concerned about the means by which natural gas is priced. He added:

You can protect yourself pricing-wise through the physical contract by basically having market-responsive pricing, which you often see – so you've got firm supplies, but you've got pricing that moves with the market – [or] you can fix your price – you can fix it for part of the time or you can fix the price in the contract and then you can unlock that pricing by using these financial derivative products. It's a very complicated thing, but I think what's important for you to know is that there are people that want to contract long-term for these supplies – there is a place in the market for it – and there will be a variety of pricing mechanisms, I think, employed across that backdrop.

SENATOR TOM WAGONER, Alaska State Legislature, referring to a comment made earlier by Mr. Harper, asked why Alaska should even consider letting its natural gas liquid (NGL) be processed in Alberta.

MR. HARPER said he was simply pointing out that the Canadians view NGL as attractive and that the infrastructure to process it already exists in Alberta. He added that traditionally producers have performed the role of extracting liquids from natural gas, and that the gathering and processing assets for doing such are predominantly owned by producers in the U.S.

SENATOR WAGONER asked how many "barrels, equivalent, of liquids," for example, could be obtained from sending 5 Bcf per day through a pipeline system.

MR. HARPER said the calculation is about six to one.

SENATOR DYSON asked whether processing NGL in Alaska might be "a deal breaker for a TransCanada pipeline."

MR. HARPER said he doesn't have an opinion on that issue at this time, though he can appreciate TransCanada's interest in it.

SENATOR DYSON asked what the price of [foreign] LNG would be on the West Coast.

MR. HARPER indicated that [foreign LNG] would come in at the highest price that can be obtained, adding, "It will price itself so that it can move at the market prices that are present."