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Henry the Hub, I Am I Am – Understanding Henry Hub: How Changing Natural Gas Flows Will Impact the Benchmark

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The Henry Hub is the best known natural gas trading location in the world. There is certainly no more liquid point in the industry. An average of almost 400,000 natural gas futures contracts trade there each day. The Henry price is used to

drive by called Henry. And the gas flow through this so called hub is minimal. Could this be another LIBOR scandal where a benchmark is not what we thought? Or is all well and good at Henry, regardless of these revelations? Let's find out why Henry is the Hub, why it developed the way it did, and how changes in gas flows from the big shale plays could impact Henry in the future.

Check out Kyle Cooper's weekly view of natural gas markets at
http://www.rbnenergy.com/markets/kyle-cooper

Here's a heads up on this blog series. The Henry Hub in some way touches almost every aspect of the U.S. natural gas market. Its function is unique, it's role frequently misunderstood, and changes are on the way to Henry Hub. The shale gas phenomenon combined with the potential for LNG exports could change its value relative to other parts of the market in North America. And that would be a big deal. Consequently this is not going to be a short blog series. It is going to take a number of postings to cover this topic. And for it all to make sense, we need to start at the beginning – where the Henry Hub came from in the first place.

The Time Before Henry

Trading of natural gas as a commodity is not something that goes back to the early days of the petroleum industry. Just over twenty-five years ago, most natural gas was sold by producers under long-term, life of lease contracts to pipelines at regulated prices. In 1985 that started to change with Federal Energy Regulatory Commission (FERC) Order 436 which created 'open access' on pipelines – in effect, allowing others besides the pipelines to ship gas. That really kicked off the spot market. Trade publications started to track prices at a variety of locations around the country, and for the first time there was some transparency in the market for natural gas prices. But it was still a very primitive market tangled up with legacy contracts and vestiges of price controls. Nevertheless, by the late 1980s natural gas started to be trade actively – mostly on a monthly basis during that magical period at the end of each month called bid week. The Natural Gas Decontrol Act finally wiped away the last vestiges of price controls in 1989.

By the time the spot market in gas developed, crude oil futures had been trading for several years on the New York Mercantile Exchange (NYMEX, now Chicago Mercantile Exchange), and #2 heating oil futures had been trading since 1978. So as natural gas emerged as a tradable commodity it was only 'natural' that NYMEX should start working on a futures contract for natural gas. No sooner did the NYMEX product development team start on the project than they ran into a big problem. A futures contract needs a delivery point. When the #2 Heating Oil contract was developed there was a highly liquid industry accepted standard in the New York Harbor. Same story in 1983 for crude oil. Cushing was already a reference point for mid-continent crude trading. (There was competition from Light Louisiana Sweet at St. James Louisiana as the best point for crude futures, but WTI and Cushing eventually won out.)

In this regard, the natural gas market had a problem. There was no generally accepted single location for gas that was used as a reference for trading. Natural gas was being actively traded at 40-50 locations around the country and the trade publications were tracking most of them, with no one point overshadowing all of the others. So how should NYMEX select the one point to be used as the NYMEX natural gas delivery location? Well, there are some generally accepted guidelines for selecting delivery points for futures contracts, among those diversity of supply, reliability, and spot price liquidity. In the gas world, that meant that the location needed to have connections with a lot of pipelines. It needed great reliability with a highly reputable operator. The market needed to use it for spot trading. And most importantly, it needed to have operational characteristics that would reduce the probability of any kind of curtailments or supply squeezes down to near-zero. Even though most futures contracts don't go to delivery, nothing is worse for a futures contract than a delivery glitch.

So by late-1988 the NYMEX team had zeroed in on Texas as the best region for a futures contract because of the large intrastate market, and came up with a potential delivery point – the network of pipelines around Katy, TX (near Exxon's Katy natural gas processing plant), just west of Houston. The area had all the right stuff, and seemed to be a shoe-in for the delivery point. But it was not to be.

Sabine Pipeline and the Henry Gas Processing Plant

Texaco's largest natural gas processing plant just south of Lafayette, LA near a little place called Erath, then across the Louisiana-Texas border (thus making it an interstate pipeline) and finally into the Port Arthur area where it connected to Texaco's refinery, chemical plant and other industrial facilities in the area. The total length of the pipeline is only about 130 miles. That big Texaco gas plant was about 7 miles south of Erath at a little town – or wide spot in the road – named Henry. The plant was called the Henry Gas Processing Plant.

The configuration of Sabine Pipeline has changed little in the past 25 years. A current map of the system can be downloaded at a link at the bottom of this posting. We'll refer back to this map in later blogs in this series. If you have trouble with the download, please email info@rbnenergy.com and we'll send you a copy.

Back to the late 1980s. Sadly, processing volumes at Henry had been declining for decades. Offshore gas production that fed the Henry plant was falling and the gas was becoming leaner – lowering the BTU content and thus reducing the production of NGLs from the plant. It was a huge facility that looked more like a small refinery than a gas plant, but the future was not looking good for the plant, and by association for the Texaco pipeline connected to it – Sabine. Worse yet, regulatory changes had resulted in further constraints on Sabine throughput. It was looking like Sabine was a dead asset.

Enter the Sabine Team

The challenge of what to do with the declining Sabine pipeline asset fell to two highly qualified and experienced Texaco executives – Jagjit Yadav and Bill English. Their challenge was to figure out how to take this hobbled asset and make it into something valuable. They accomplished that goal in spades. While the spot market was still forming in 1988, they recognized that Sabine, particularly the end of Sabine near the Henry Plant was uniquely positioned with a number of pipeline interconnects. Back in the Henry Plant's heyday, lots of pipelines had connected to the plant for supplies. That suggested their initial plan to revitalize Sabine - turn Sabine into a place where gas could be interchanged between pipelines.

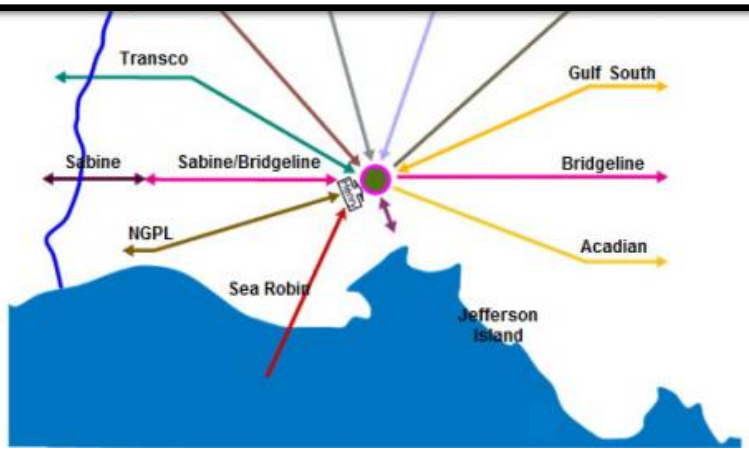
They went to work and came up with a number of innovations that later proved critical for the success of the Hub. For one thing, they developed a creative imbalance agreement with the other pipelines that vastly simplified the physical delivery process. Second, they were able to get FERC to approve an innovative regulatory structure which allowed Sabine and the Texaco intrastate system (called Bridgeline) to be operated as a single system, vastly simplifying operations[1]. And third, they came up with a marketing spin that would help sell the concept – they called it the Henry Hub.

While all of this was going on, NYMEX was moving forward with the Katy alternative. It has some real advantages. For example, Katy was just outside Houston, so it would be easy to conduct tours for the financial community in New York, who after all were expected to be the first significant users of the contract. (At the time, many "real" gas people thought that futures were the work of the devil, and such a non-physical mechanism surely would never be accepted in the gas market.)

But before the Katy deal was sealed, Jagit and Bill recognized that becoming the NYMEX delivery point could be a huge boost to the business at their new Hub operation. Bill placed a "cold call" to NYMEX and fortunately was connected with Brad Leach who was heading the natural gas initiative. Bill pitched a concept that the Henry Hub would be the best delivery point for the new contract because: (a) it was a point where a lot of different pipelines connected, (b) that all of these pipelines were vastly oversized since volumes had declined, thus there should be little concern about the availability of capacity, and (c) it had a catchy name with a schematic that showed all the connections into the hub in a format that even financial traders could understand (You can still download a copy of that schematic from the Sabine website here). In addition, Jagit and Bill came up with a way to make money on all of this – something called IHT (Intra-Hub Transfers) that we will talk a lot more about in a later blog. Basically the Sabine team swooped in on NYMEX with this plan and the rest is history. It worked. NYMEX selected the Henry Hub as its delivery point and started trading futures contracts for natural gas in April 1990.

What is the Henry Hub and What is it Not?

First, it is not a hub in the common understanding of the term – a hub and spoke system with a single set of valves and pipes in the middle and pipelines fanning out from its center. I am proud to have contributed to this misunderstanding, having developed the artist rendition of the Henry Hub shown in the graphic below, used in Bentek's Hub Flow Maps (which uses data that we'll examine in a subsequent posting in this blog series).



Although the pipelines in this graph are Henry Hub receipt and delivery points, many are located significant distances apart, connecting across the spaghetti bowl of pipelines that crisscross Vermillion Parish in South Louisiana.

Second, for the same reason, the Henry Hub is not all at Henry. The Henry gas processing plant (which finally shut down more than ten years ago) is at Henry, LA. But the interconnects to Sabine are scattered across the area around Henry. Thus the Henry Hub is a metaphysical concept, not a place where a lot of pipelines all connect at a single point.

Fortunately the metaphysical concept overlays the steel pipelines and compressors of the Sabine system. That system really does provide interconnects to eleven pipelines designated the Henry interconnects: Columbia Gulf (CGT), Gulf South, Bridgeline Intrastate, NGPL, Sea Robin, Southern Natural (SONAT), Texas Gas, Williams/Transco, Trunkline, Arcadian, Jefferson Island Storage and of course Sabine. And as shown in the map (downloadable below), Sabine continues westward connecting into another thirteen facilities in Louisiana and nine more in Texas.

The Henry system does not handle large volumes of physical gas. There are two reasons: (a) most futures contracts do not go to physical delivery, and (b) the IHT system mentioned above actually 'nets out' many physical deals before they ever make it to a pump schedule. We'll examine these two phenomena in later editions of this blog series, looking carefully at the actual gas flows across the Hub.

But Henry is one big thing. Henry Hub is liquid. The Henry Hub is the delivery location for a futures contract that trades on average about 400,000 contracts per day. It is one of the top five most liquid points on the ICE day-ahead trading system. If you want to place a big position in the forward market for U.S. natural gas and be assured you can unwind the position quickly, the Henry Hub is the place to be.

There have been other contenders for this high profile role over the years, with Perryville, Louisiana being one of the most recent. There is already talk of an alternative hub in Appalachia to sync up with the rapid growth of Marcellus natural gas production. Don't you believe it. Again, we'll talk more about the whys and wherefores of Henry's dominance as this series progresses.

Henry is also the benchmark for gas prices at all other pricing points, which are generally set at differentials to Henry. That means that Henry can be the rising tide that lifts all boats. Or vice versa. That fact had a huge (downward) impact on the gas market when a number of new pipelines from Texas shale gas plays were built into Henry's back yard in the 2006-2008 timeframe. Increasing volumes of shale gas and the possibility of LNG exports portend another round of Henry-Hub-as-Market-Rollercoaster over the next few years.

We'll wrap this one up for today. Over the next couple of weeks there will be much more to come on Henry the Hub.

[1] Chevron's Sabine and Bridgeline systems actually share the same piece of physical pipe for a portion of the route, an unusual regulatory structure that allows an interstate and intrastate pipeline to co-exist.

some aspect of energy market behavior. Receive the morning RBN Energy email by simply providing your email address – click here.

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Electric cars are they conserving energy? Rev4

Permalink Submitted by YJDraiman on Sun, 09/30/2012 - 11:30.

Electric cars are they conserving energy? Rev4

Ask yourselves what is the real cost of "Electric Car"?

Note: Electricity is a secondary form of energy derived by utilizing one form of energy to produce electric current.

Let us look at the facts:

In order to produce electricity, we need some form of energy to generate electricity, whereby you lose a substantial amount of your original source of energy in the generation process.

In the process we are losing the efficiency of the initial energy source, since it is not a direct use of the energy.

Let us take it a step further. To generate electricity we utilize; coal, oil, natural gas, nuclear, hydro electric - water, photovoltaic-solar, wind, geothermal, etc. Many electricity generating plants utilize fossil fuel, which creates pollution.

Do you realize how much of the initial source of energy you lose to get the electricity you need for your electric automobile; you also lose electricity in the transmission lines.

Why are we jumping to a new technology, without analyzing the economic cost, the effective return and efficiency of such technology; while computing and measuring its affect on the environment?

Natural gas vehicles are a direct source of energy, where you get the most for your energy source – in efficiency and monetary value. Cost of natural gas to a comparable gallon of gas ranges around $1, it has higher octane and extends the life of your engine, it is also safer than gas.

Another economic impact would be the loss of road tax on fuel, these funds are used to build and maintain the highway infrastructure.

"It is Cheaper to Save Energy than Make Energy"

YJ Draiman, Director of Utilities & Sustainability

http://www.energysavers2.com

Will High Electricity Rates Drive Innovation?
Escalating costs of OIL will produce innovation!

http://www.yjdraimanformayor.com

Electric cars are they conserving energy? No!

I worked with UPS in Chicago in the early 90's, researching the conversion of UPS vehicles to Natural Gas as a primary fuel with overnight slow fill stations on UPS compound.

If we are to survive the Energy crisis and become energy independent, we must utilize every effort not to waste our energy resources. Innovation and technology will eventually save the day.

Electric cars are a fiction of energy conservation, (Look at all the costs associated with such technology); it is not a viable option.

We must look into other forms of fuel, and invest heavily into R&D.

YJ Draiman, Director of Utilities & Sustainability

http://www.yjdraiman.org

Energy & Utility Auditor, Energy efficiency analysis

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