

Tight Supply Reins In The Worldwide Helium Market

By Maura D. Garvey

Tight supply is the most notable aspect of this year's review of the worldwide helium market. Uncertainties relating to timing of future supply sources, projecting market demand during uncertain economic times, and the United States Bureau of Land Management's (BLM) changing role in supply make this a challenging market to manage. This year was particularly tough with supply disruptions affecting most of the major sources of helium across the globe. Disruptions resulted from a range of factors including the lack of feedstock from LNG plants caused by lower consumption during the economic recession, planned and prolonged maintenance shutdowns, the Russian discontinuation of exports, and trouble maintaining pressure in the BLM pipeline, a system entering declining stages of output. The tight supply of helium is expected to remain until significant new planned supply comes on at Qatar II in mid-2013. Two projects due to come on line prior to 2012 will provide some respite. These include the startup of the Air Products/MATHESON joint venture at Big Piney, WY late this year and the Skikda LNG megatrain plant coming on late next year, which will supply additional feedgas volumes to their existing helium plant. We expect that these additional supplies will be fully consumed by existing demand.

To get the insider's view of this critical industrial gas market, *CryoGas International* spoke with the helium experts at major industrial gas companies. An important point noted by all is the changing role of the BLM on the global supply chain. For example, Phil Kornbluth, Executive Vice President, International & Helium at MATHESON, noted, "The global helium supply chain has become increasingly unreliable over the last few years and it is becoming evident that the BLM will be less able to function as the industry flywheel in the future. The result is, that as an industry, we have lost some of our ability to maintain reliable supply in the face of planned or unplanned supply disruptions." John Van Sloun, Air Products General Man-



Photo courtesy of APMTG Helium LLC

ager, Helium and Rare Gases, noted that "The BLM used to be able to operate at higher rates than the 2.1 billion cubic feet per year (Bcf/yr) for a short period of time, masking other disruptions in helium supply. However, due to the natural decay of the field and reduced pressure in the reserve, BLM has been unable to support all the plants on the pipeline, eliminating their capability to temporarily mask other disruptions."

The Helium Market in 2010 & 2011

Last year we reported that by 1Q09 helium production appeared to be exceeding global demand by as much as 10 percent with an estimated market size of 5.7 Bcf of helium, but still below the 2007 peak of 6.4 Bcf. The global economic recession that drove helium demand down during 2008 and 2009 improved in 2010 and into 2011, but to varying degrees across all geographic regions. This demand was primarily driven by Asia and the Middle East (ME) and the electronics industry, including semiconductor manufacturing, LCD, and fiber optics.

Our assessment of the 2010 worldwide market for helium is about 6.15 Bcf, and leveling off to 6.2 Bcf in 2011 due to continued tightness in supply. We are at the stage where all helium produced is being consumed and demand growth is constrained by supply. If demand were unrestricted by supply, we estimate demand could be closer to 6.4 Bcf. According to Gerard Tan, the Air Liquide Worldwide Helium Director, "Without the disruptions in helium sources, growth could have been more robust in 2011 leading into 2012. The disruptions in the various helium sources affected all players at one time or another. Air Liquide was not immune. This shortage will continue until the end of 2011

and will have lasting impact to valuation of helium supply in all business segments."

Overall, the consensus is future demand growth worldwide will be in the 2-4 percent range, with supply and global economic growth being key factors. Nick Haines, Head of Source Development of Linde Global Helium, noted, "Linde believes global growth will be in this range because supply is the limiting factor. This, of course, depends on whether the product is available to meet the demand and other factors such as the global economy." The future of the global economy remains uncertain.

Recovering Demand

The industry consensus is that the helium market should be able to recover to 2007 demand levels by mid-2013 when planned major new supply is added. This projection reflects a best estimate based on known demand data and historical information on how helium markets have recovered in past economic downturns. *CryoGas International* discussed this helium demand scenario and projections for future growth in North America, Europe, Asia, and the ME with the major gas companies. We also reviewed the applications behind the demand and the basis for growth in the fastest growing segments.

The overall consensus among industrial gas producers is that new demand for helium will grow the fastest in Asia at around 7-10 percent and in the ME at around 4-7 percent. According to Gerard Tan, "Air Liquide's new sourcing in the ME (Qatar II) and enhanced logistics system between Asia and the ME are in place to meet the needs of these strong growth regions." Demand growth in the US and in Europe will be slower, 1-2 percent projected in the US and 2-3 percent in Europe.

The electronics industry will remain the main growth driver for helium as that market has rebounded more quickly than others. The growth in Asia can be expected to be broad-based, encompassing electronics-related segments, such as fiber optics, LCD, and semiconductor manufacturing, and general manufacturing and healthcare related applications as the overall economy expands.

Currently, the US remains the largest market for helium demand worldwide, at about 39 percent, or about 2.45 Bcf/yr, as shown in Figure 1. This is down from 44 percent in 2009. The rate of demand growth for helium in the US has declined since 2000 as large markets for helium, such as MRI, matured. John Van Sloun explained that “the economic conditions in the US and Europe as well as increased helium conservation and recycle measures are also responsible for reduced demand.”

Asia represents the second largest market for helium with 27 percent of worldwide demand, about 1.65 Bcf/yr. This represents a 28 percent growth in demand since 2009, with the net effect an increase of three percent in their global share of demand. Asia is a fast growing market with demand nearly doubling between 2000 and 2007. Japan and China are the largest markets in Asia, but demand growth is largely driven by the booming Korean and Taiwanese electronics markets. As noted by Phil Kornbluth, “Non-electronic manufacturing in Asia is also contributing to helium demand growth, as manufacturing processes are becoming more sophisticated in China and emerging markets.” The primary supplier of helium for Asia is the US. Additional supply comes from the RasGas plant in Qatar. Linde’s new Darwin, Australia plant also supplies this region.

Europe, the third largest market for helium, comprises about 21 percent, or 1.3 Bcf, of worldwide helium demand. Helium applications remain less saturated in Europe than in the US. Current and planned helium production from Algeria, with backup from the US and Qatar, will keep Europe adequately supplied.

The other Americas (Canada and Latin America) and the Rest of the World (ROW), including the ME, together represent thirteen percent of the global market. These regions traditionally have contributed to strong demand growth, and are expected to grow about 4–5 percent per year going forward, driven by industrialization in their emerging economies.

US Government’s Role in Helium

The US government operates an extensive helium pipeline system that includes the storage reservoir in the Bush Dome–Cliffside Field, TX and a 425-mile pipeline system originating at the Cliffside plant and ending near Bushton, KS. The government manages this system through the BLM, which is an agency of the US Department of the Interior. The pipeline connects nine privately-owned crude helium plants and six privately-owned helium purification/liquefaction plants to the Cliffside Gas Field. The current withdrawal rate from BLM storage (operationally capped at 2.1 Bcf/yr), unaccounted-for losses, and depletion in the Hugoton, will bring the Cliffside Fields contained helium to an estimated 10 Bcf by 2015. This drawdown is an issue of concern to the US government and is one of the reasons the National Research Council (NRC) formed the Committee on Understanding the Impact of Selling the US Helium Reserves, which produced the report *Selling the Nation’s Helium Reserve* in January 2010.

This study, however, did not provide any guidance about the role of the BLM after 2015. The 1996 Helium Act requires that the product be “offered for sale” by 2015—not all to be either sold or redelivered by 2015. This means in practice that significant crude helium will remain in the Cliffside reservoir after 2015, and that crude will likely be delivered to refiners after 2015. According to Nick Haines, “When the government debt is repaid (estimated to be by 2015), the BLM will in all likelihood be operating on ‘Appropriated Funds’—different from the current model whereby they operate using the proceeds from helium and natural gas sales to fund their operations. The impact of this change on the BLM operations is unknown.” Regarding the crude helium remaining, it is conceivable that Congress may pass legislation to keep a more substantial “Strategic Reserve” than was contemplated in the Helium Act (i.e. 600 Mcf) and continue to sell any remaining

Worldwide Helium Demand 2011

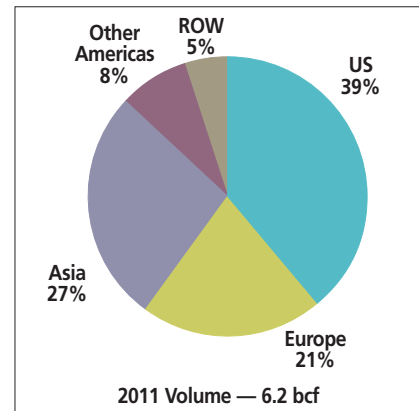


Figure 1 Source: CryoGas International Estimates

helium down to that level, as was suggested in the report, *Selling the Nation’s Helium Reserve*. Of interest to our industry is whether Congress will define a new pricing model for any available and unsold helium after the Helium Act expires.

In late July, the BLM raised their open market crude helium price 1.0 percent to \$75.75 for FY2012 as compared with the 15.8 percent increase to \$75/Mcf for FY2011. (See Figure 2.) The percent change variation between these two years has industry leaders concerned. The FY2011 price was determined after reviewing several industry data points that indicated crude helium prices were much higher than the FY10 price (\$64.75). According to Leslie Theiss, Director of BLM Amarillo, TX, “This year the BLM had difficulty obtaining market pricing, so we went back to the Consumer Price Index (CPI) to determine the FY2012 crude helium pricing. The BLM is continuing to evaluate the pricing mechanism and we will use market-based data in the future.”

Gerard Tan says, “It [BLM pricing] has caused some confusion, as it is clearly not in line with the previous year’s increase. This makes the BLM index on the market valua-

US BLM Crude Helium Price Changes (US\$)

Fiscal Year	BLM Crude Helium Price		Percent Change by FY	
	Open Mkt	In-kind	Open Mkt	In-kind
2012	75.75	65.50	1.0%	1.2%
2011	75.00	64.75	15.8%	0.0%
2010	64.75	64.75	4.0%	4.0%
2009	62.25	62.25		

Figure 2

Source: US BLM

tion of helium unpredictable.” Until the BLM is able to establish a market price-based mechanism, budgeting and planning is also a problem for the industry. John Van Sloun, notes, “We need consistency as large swings make it hard for our industry to budget and plan accordingly. These BLM price announcements used to be made around the March time-frame. Now they are announced closer to August, near the end of the fiscal year, which makes it difficult to incorporate the new pricing in contracts. In some cases, we may not be able to recover the difference.”

It is well known in the industry that some of the world’s helium sources index their prices to the BLM’s posted price as it is the only one published. Ben Glazer, Praxair’s Global Helium & Rare Gases Manager, notes, “It [BLM price] typically sets the floor of increases in the market.” Glazer adds, “What is more relevant is that non-BLM providers, which make up approximately 70 percent of the supply, have been increasing prices at rates nearly three times greater than the BLM over the last decade. This is representative of the value of the product as a scarce and non-renewable resource as well as the cost to invest in new sources, which are more difficult

to develop and more challenging logistically. The price of helium is a reflection of these trends and we would expect to see prices rise by double-digit percentages annually for the next several years as a result.”

The consensus among the helium experts is that natural market forces of supply and demand will set the price of helium once the BLM posted price comes to an end.

Worldwide Helium Supply

As noted, new sources and expansions to helium capacity/production have come on-stream or are planned in Darwin, Australia, Big Piney, WY in the US, and in the ME/Africa (i.e., Qatar II and Skikda) during the next three years. These sources should be sufficient to meet worldwide demand for the next five years, given modest growth in demand and continued global economic recovery. There should be adequate future sources of helium from natural gas projects, even in the US (i.e., carbon dioxide recovery for enhanced oil recovery projects like the one being considered by EOR in St. Johns, AZ). However, consensus is that they will provide helium at much higher prices than users are accustomed to paying.

Substantial worldwide helium reserves exist in North America, the ME/Africa, and Russia that could sustain the helium industry for hundreds of years. As Ben Glazer explained, however, “Those reserves are typically more difficult and costly to develop, which is why they have remained undeveloped to date. We expect those reserves to be developed to meet future demand as the supply/demand and pricing situation begins to justify the increased level of investment required.” Gerard Tan further explained the need for new projects in this way: “The helium market consists of applications that, in the next 10–20 years, cannot substitute helium due to its unique properties, hence the demand for helium will continue to grow. As supply tightens, the value of helium will increase and justify new projects to extract more helium. With innovative ways to store excess productions (like in Amarillo), helium prices can remain stable, returning value back to these investments for new facilities.” ■

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