

PAH NEWS PIX

- NMA WANTS NATIONAL MINING POLICY
- PHELPS DODGE EXPECTS COPPER DEFICIT
- IAMGOLD ACQUIRES WHEATON RIVER
- EU TOUGHENS MINING WASTE RULES

C A L E N D A R

- **Sixth International Gold Symposium**
 May 4–5, 2004
 Museo de la Nacion
 Lima, Peru
 email: cmendoza@snmpe.org.pe
- **Global Mining Forum**
 May 4–7, 2004
 Hilton London Metropole
 London, United Kingdom
 email: iiconf@iiconf.com
- **CIM Mining Industry Conference & Exhibition**
 May 9–12, 2004
 Shaw Convention Centre
 Edmonton, Alberta, Canada
 email: jgaydos@cim.org
- **Mines & Money Vancouver**
 May 19–21, 2004
 The Fairmont Hotel
 Vancouver, BC, Canada
 email: minesandmoney@mining-journal.com

Energy and the Economy — Market Forces at Work

Last month the Pincock Perspectives examined the issues of natural gas reserves, production, and sharp increases in price due, in part, to a dramatic increase in the amount of natural gas used for electricity generation. We questioned whether power generation was the most appropriate use of limited domestic natural gas resources given its preferred status as a fuel in other market segments such as residential and commercial heating, its use in numerous industrial applications, its critical importance as a feedstock in production of plastics, explosives, fertilizers, and many other products, and the availability of massive domestic coal resources that could be used for power generation. This month's article further explores this issue.

Relatively low cost power has been a boon to the U.S. economy. It supports job growth and a standard of living that are the envy of much of the rest of the world. It is one of the primary drivers of U.S. competitiveness in international markets. Unfortunately, high natural gas prices are already eroding these benefits. As the Wall Street Journal noted in a February 17, 2004 article:

"High natural-gas prices in the U.S. are taking an increasing toll on a range of companies, forcing them to change how

they operate and even to shift work to parts of the world where energy prices are lower."

"For manufacturers...high natural-gas prices mean another unavoidable cost that cannot be passed on to customers."

"U.S. chemical workers have lost an estimated 78,000 jobs since natural-gas prices began to rise in 2000."

"So while demand soared in recent years, especially from a raft of new gas-fired plants, producers have struggled with supply. Most North American gas fields are years past their prime, and environmental restrictions prevent drilling on many of the most promising areas."

"The root of higher natural-gas prices is a federal policy that promotes use of the relatively cleaner-burning fuel without providing incentives or means for natural-gas companies to increase production."

Domestic natural gas production is not expected to increase. The Energy Information Administration (EIA), in its 2004 Annual Energy Outlook, forecasts that natural gas production from the lower 48 states, including production from traditional

■ NMA WANTS NATIONAL MINING POLICY

The National Mining Association (NMA) is urging Congress to pass a policy that would make the U.S. a more attractive mining investment venue. Connie Holmes, NMA senior economist, told the Congressional Committee on Small Business that the U.S. must develop and implement a national minerals policy that would allow mining companies access to resources for development. Holmes says that resources can be developed in a timely, socially and environmentally responsible manner. Recent studies have documented that regulatory uncertainty and delays in the U.S. have forced investors to look at other countries for mining ventures.

■ PHELPS DODGE EXPECTS COPPER DEFICIT

Phelps Dodge Corporation, the world's largest publicly traded copper producer, expects the world copper market will hit a deficit of approximately 500,000 tonnes by the end of 2004. World exchange inventories of high-grade copper cathode are currently hovering at about 500,000 tons, one-third of the 1.5 million-ton peak reached in April 2002. Steadily dwindling refined copper inventories, supply disruptions and high demand from China earlier this year combined to increase copper prices to 8-1/4 year highs. In January, Phelps Dodge forecasted an average 2004 copper price at or above \$1.10 a pound.

■ IAMGOLD ACQUIRES WHEATON RIVER

The gold industry has a new major producer after the \$3 billion acquisition of Wheaton River by IAMGOLD. The new group, which will be renamed in the next few weeks, will remain headquartered in Toronto. The new company will have an annual production of over 1 million ounces of gold, which will place them twelfth in the global rankings. Under the deal, Wheaton River will exchange one of its shares for 0.55 of an IAMGOLD share, a ratio that represents a 22 percent premium over the 5-day average closing price of Wheaton's shares as of March 30. This is the third major gold transaction this year following the \$620 million Mvela-Gold Fields deal and the \$1 billion putative Norilsk Nickel purchase of Anglo-American's stake in Gold Fields.

on-shore and off-shore sources as well as from unconventional sources, will remain relatively stable in the 19 – 21 trillion cubic feet per year range through 2025. Natural gas demand, on the other hand, is expected to increase substantially, from approximately 21 trillion cubic feet in 2002 to almost 29 trillion cubic feet in 2025. The difference between demand and lower 48 production will be made up by relatively high priced Alaskan production and LNG imports.

As a result, the EIA also projects that natural gas prices will remain high, with wellhead prices climbing from approximately \$5.00 per 1000 cubic feet in 2003 to almost \$8.50 per 1000 cubic feet in 2025. The price of gas delivered to consumers will in all likelihood be higher yet, reflecting additional transportation costs. Of course, the EIA's forecast assumes that an Alaskan natural gas pipeline and LNG import terminals can be built. While at least six companies are currently planning LNG conversion facilities along the California Coast and northern Mexico, developers expect heavy opposition from environmental and other "nimby" groups. If environmental constraints or other factors preclude construction of these facilities, natural gas prices may well go even higher.

Coal, of course, is America's most abundant fuel resource, with a demonstrated reserve base of approximately 500 billion short tons.¹ Recoverable reserves at existing mines are sufficient to last almost 200 years at the current production rate of roughly 1.0 billion tons per year.² As a result,

¹ www.eia.doe.gov/cneaf/coal/statepro/imagemap/us4p1.htm

² *ibid.*

coal prices are expected to remain stable. In fact, EIA forecasts that the average delivered price of coal delivered to electricity generators will decrease slightly, from \$1.26 per million BTU to \$1.22 per million BTU on a constant dollar basis, over the next 20 years.³ Figure 1 (shown on page 4) provides the EIA forecast comparison for the demand and price of coal and natural gas through year 2025.

The power generation industry has, perhaps belatedly, begun to recognize how dramatically the difference between coal and gas prices affects the cost of power generation. Despite the fact that gas fired plants are less expensive to build, more environmentally friendly, and more efficient in terms of the amount of heat input required to generate a given amount of electricity, the low and stable price of coal more than overcomes these advantages. In fact, given current generation technology and environmental regulations, coal-fired generation is more cost effective whenever gas prices exceed \$3.00 per million BTU.⁴ As can be seen from the EIA forecasts discussed above, therefore, coal should maintain its competitive advantage throughout the forecast period.

In addition to its inherent cost advantages, coal fired generation is becoming increasingly environmentally friendly. Notwithstanding the current controversy regarding emissions from existing coal-fired power plants,

³ Energy Information Administration/Annual Energy Outlook 2004

⁴ One million BTU of natural gas is approximately equivalent to 1000 cubic feet, so the price of \$3.00 per million BTU can be compared almost directly to the EIA's gas price forecasts, which were stated in terms of dollars per cubic foot.

emissions from new coal fired plants will be limited by stringent environmental regulations. So-called "best available control technology" or BACT will be required on all such plants, including scrubbers or other technology to limit sulfur dioxide (SO₂) emissions, selective catalytic reduction (SCR), low NOx burners, and over-fire air to limit nitrogen oxide (NOx) emissions, and fabric filters known as "baghouses" to limit particulate emissions. Furthermore, in anticipation of emerging mercury (Hg) emission regulations, a variety of Hg control technologies are under development. Industry observers expect that some version (or versions) of these technologies will be widely implemented over the next several years.

The coal and power industries, in conjunction with the U.S. Department of Energy, are also developing a prototype of a so-called "zero emissions" coal-fired power plant. The zero emissions plant, in addition to having traditional SO₂, NOx, and particulate emission control technology, as well as some sort of Hg control, will also capture and sequester carbon dioxide (CO₂) formed during the combustion of the coal. Various carbon sequestration technologies are already under development.

As a result of coal's clear economic advantage and its increasingly benign environmental impact, power generators, a strategic shift is underway in the power industry. Over 90% of the approximately 300,000 MW of generating capacity built over the last five years was gas-fired. Now, however, over 100 coal-fired plants, with a combined capacity of approximately 60,000 MW, are under construction or in the planning stages. In some cases,

such as the recently announced construction of a 200 MW plant by the City of Springfield, Illinois, these new plants, again equipped with the latest in environmental control technology, will replace existing older plants that lack such controls. Overall emissions will be reduced as a result. In other cases, such as the construction by Tucson Electric of two new large plants at its Springerville, Arizona site, generators have agreed with regulatory jurisdictions to upgrade emission control technology on existing plants at the same time the new plants are built. Again, overall emissions will be reduced.

What do these developments bode for U.S. energy prices, our standard of living, and our competitiveness in international markets? Despite the fact that the U.S. has not had an effective national energy policy for some time and has yet to reconcile trade-offs between increased energy production and environmental concerns (the subject, perhaps, of a future Pincock Perspective), market forces are acting effectively to conserve relatively limited, high priced gas resources and exploit relatively abundant, low priced coal. High priced gas-fired plants are being closed at the same time lower cost coal-fired plants are being built. As a result, less gas will be used in power generation and more will be available for use in other markets. PAH does not suggest that coal should replace natural gas in all applications but, rather, that market forces already in place can effectively allocate scarce natural resources. In so doing, overall energy costs will be minimized and U.S. standards of living and economic competitiveness will be maximized.

This month's article was written by PAH's Coal and Energy Services staff.

■ **EU TOUGHENS MINING WASTE RULES**

The European Parliament voted to toughen draft rules that would force mining companies to spend more money to reduce the risk of environmental disasters from waste dumps and toxic ponds. Mining and quarrying firms will need to set aside funds to monitor the safety of slag heaps for a longer period of time than was originally specified in the European Commission proposal. In the original proposal, the environmental safety rules would have only applied to slag heaps from new extraction industries. Parliament also voted to make mining firms pay for the clean up of waste dumps where they constituted a major environmental danger. The proposal was prompted by the Baja Mare gold mine disaster, when waste from a state-owned mine in Romania polluted several rivers, and a 1988 spill at a lead and zinc mine which threatened Spain's biggest wildlife reserve. EU environmental ministers will discuss the draft bill in June. An agreement is not expected until 2005 at the earliest.

Minerals Corner—

Shattuckite

Cu₅(SiO₃)₄(OH)₂, Copper Silicate Hydroxide

Shattuckite is a relatively rare copper silicate mineral with a very attractive blue color, which is considered its best asset. Shattuckite is a secondary mineral that is formed from the alteration of other secondary minerals. It was first discovered in 1915 in the copper mines of Bisbee, Arizona, specifically in the Shattuck Mine for which it is named. At the Shattuck Mine, shattuckite forms pseudomorphs after malachite. A pseudomorph is an atom by atom replacement of crystal structure by another crystal structure but with little alteration of the outward shape of the original crystal. Because of its unique color, Shattuckite is used mainly as an ornamental stone.

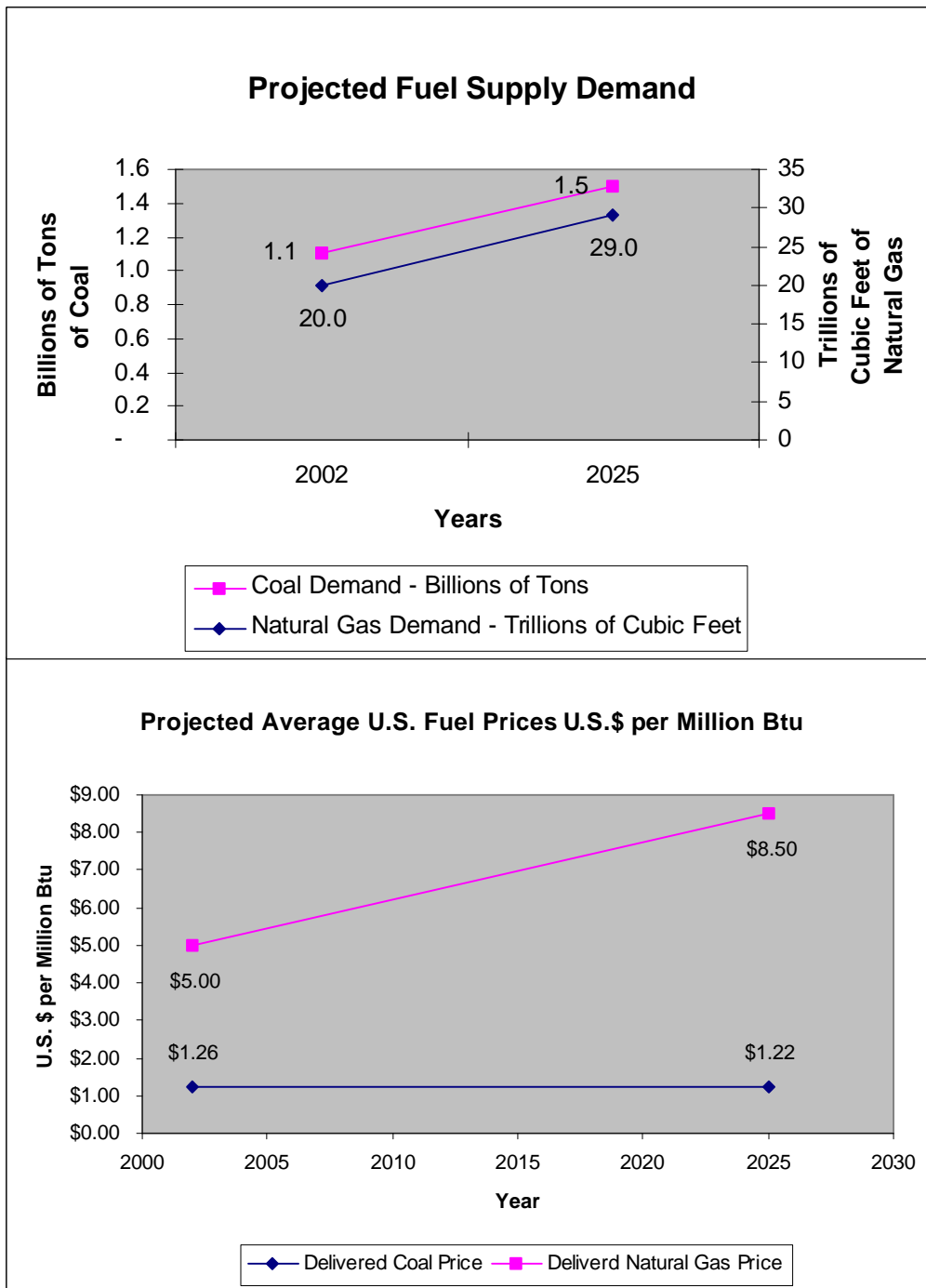


FIGURE 1



PINCOCK ALLEN & HOLT

Delivering smarter solutions