

# The Illinois Basin, A Second Coming?

BY EMILY MEDINE

There is no dispute. The Appalachian coalfields are depleting. Current production levels in Appalachia cannot be sustained even with higher prices. Depletion is most evident in the Central Appalachian coalfields where production levels barely increased between 2003 and 2004 despite a doubling in the coal price. Within 20 years, depletion in Northern Appalachia will also affect total production levels.

Many supply regions are already vying to replace Appalachian coals. The successors will be some combination of imports, Powder River Basin (PRB) coals, western bituminous coals, and the Illinois Basin.

Imports, which have been a nominal source of coal supply since the 1970's, are expected to increasingly become an important component of the coal supply, particularly for coastal utilities. In 2004, coal imports are estimated to have exceeded 28 million tons. With the exception of imports from Canada, which account for less than 3 million tons, this coal moves largely into the power generation market. South American imports have and will dominate due to their transportation advantage to east coast markets. Imports from other countries could play niche roles such as ultra-low sulfur Indonesian coals are doing today at Bridgeport Harbor.

PRB coals have been displacing Appalachian coals for more than a decade and are expected to continue to do so. Ultimately boiler design and transportation constraints limit complete penetration as there are simply some plants for which this switch is not economic. New pricing strategies of the Union Pacific and the Burlington Northern-Santa Fe, if successfully implemented, may also reduce the competitiveness of PRB coals in some eastern markets.

Western bituminous coals have had some success in displacing Appalachian coals due to their comparable quality. However, limited availability of coals from Colorado and Utah, and often difficult transportation constrain their total contribution.

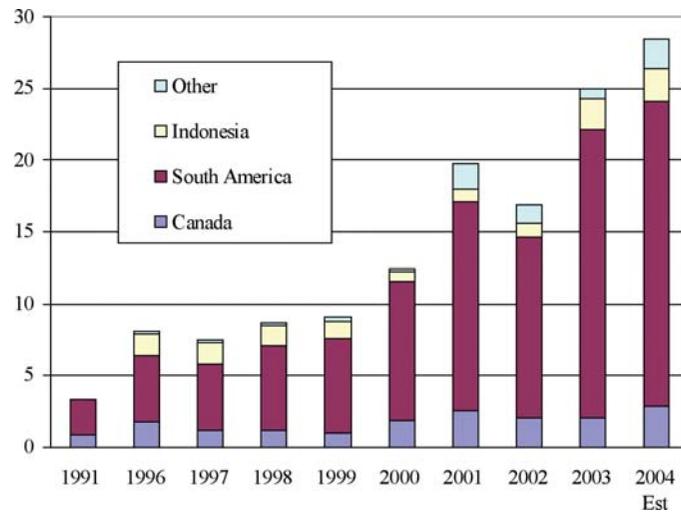
It is the Illinois Basin that many industry participants are now looking to as a domestic replacement for Appalachian coal. The demonstrated reserve base

according to the Department of Energy exceeds that of all of Appalachia. Illinois alone has demonstrated reserves in excess of 100 billion tons (See Table 1).

The Illinois Basin consists of the coalfields in Illinois, Indiana and western Kentucky. The coals produced in this region are from the

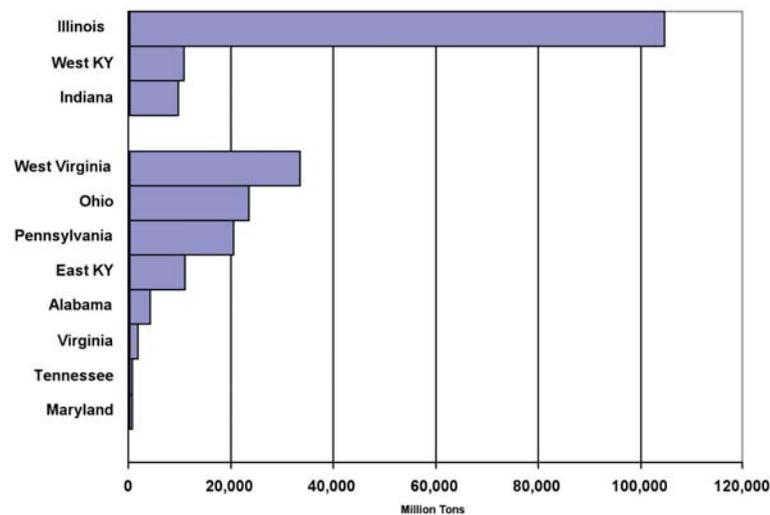
same geological formation. The coal is bituminous with 10,000 to 12,500 Btu/lb and mostly over 2% sulfur. There are pockets of low sulfur coals in Indiana and Illinois but virtually no low sulfur coal in west Kentucky. Most of the low sulfur coal in Illinois has already been mined and the Indiana low sulfur coal is being heavily mined today.

Table 1: U.S. Coal Imports (Million Tons)

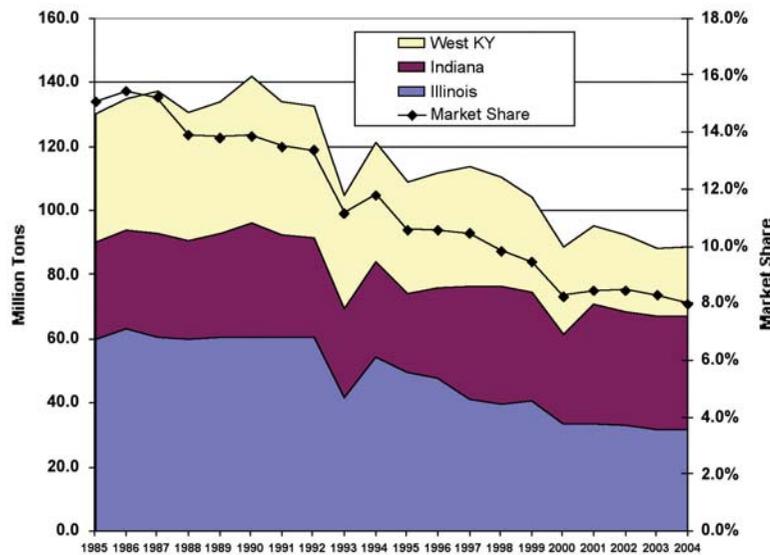


Source: Energy Information Administration, Department of Energy.

Table 2: Demonstrated Reserve Base for Appalachia and the Illinois Basin



Source: Energy Information Administration, Table 15. Recoverable Coal Reserves at Producing Mines, Estimated Recoverable Reserves, and Demonstrated Reserve Base by Mining Method, 2003.

Marketwatch *continued***Table 3: Illinois Basin Production (1,000 Tons)**

For many years, the Illinois Basin, in general, and Illinois, in particular, provided large quantities of production. The role of the Illinois Basin declined over time reflecting the dual realities of tighter air emission regulations and the availability of low cost PRB coal. Between 1990 and 2000, Illinois Basin dropped by over 50 million tons and its market share went from over 15% to about 8% (See Table 2).

Illinois Basin coals have moved into some "Appalachian" markets in 2004 and 2005 as a result of the current high-priced environment for Appalachian coals. For example, AES Somerset (New York) and Carolina Power & Lower both purchased some Illinois Basin coals in 2004 to supplement their historic Appalachian supply either because supplies simply were not available or the economics of spot purchases of Illinois Basin coals were more compelling.

These, however, are simply situational opportunities for Illinois Basin because of the current market. The more significant market potential develops as a result of the retrofitting of flue gas desulfurization (FGD) or scrubbers on existing power plants, particularly those plants originally designed for Illinois Basin coals that were switched to lower sulfur bituminous coals in order to comply with environmental requirements.

Some southeastern utilities have already agreed to retrofit scrubbers on substantial amounts of coal-fired capacity. Others are expected to follow suit as a result of the administration's Clear Skies initiative or other legislation that is likely to reduce allowable emissions of sulfur dioxide to levels that cannot be achieved without substantial scrubbing.

Not surprisingly, a number of coal industry participants are seeing future opportunity in the Illinois Basin. Several coal producers are actively amassing and/or consolidating their reserve positions in the Illinois Basin in hopes of benefiting from this opportunity. However, the Illinois Basin's success in recapturing this market is far from a foregone conclusion.

The biggest impediment to Illinois Basin coals displacing Appalachian coals in newly scrubbed units in the southeast relates to the "blue plume" phenomenon. The blue plume is a mist of sulfuric acid. In some instances, utilities are experiencing a blue plume following the retrofit of selective catalytic reduction (SCR) for the control of emissions of nitrogen oxide (NOx) on units equipped with FGD's. The SCR's are also required to comply with new or expected tighter emission limits on NOx.

Interestingly, the blue plume does not seem to be a problem for scrubbed plants also equipped with wet electrostatic precipitators (ESP's) since this equipment appears to be reasonably effective in removing the smaller acid aerosol formed in the SCR.

The significance of the blue plume first gained national attention following the retrofit of SCR's on Ohio Power's Gavin station. American Electric Power, the parent of Ohio Power, ultimately purchased an entire town located downwind of the Gavin station because of its concerns regarding the health consequences of the blue plume.

According to scientists, the blue plume problem occurs because the SCR catalyst also oxidizes sulfur dioxide in the flue gas to SO<sub>3</sub> while it converts nitrogen oxides to

elemental nitrogen. Water vapor and SO<sub>3</sub> combine to make sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), which comes out of the stack as an aerosol. It does not appear that SO<sub>3</sub> created in the SCR is effectively removed in wet scrubbers.

The additional acid aerosol has a significant impact upon stack opacity, thereby creating a visible blue plume. Since sulfur dioxide concentrations are directly related to coal sulfur content, the difficulties associated with the creation of a blue plume are correlated with coal sulfur content.

Solutions to the blue plume problem are actively being sought. The "easiest" solution is to use lower sulfur coals. Chemical additives are being used by utilities which are under contract for higher sulfur coals or for whom higher sulfur coals are clearly the most economic alternatives. Some utilities are even considering the retrofit of wet ESP's.

The problem for the Illinois Basin is that the scrubbers are being designed today in the context of the "blue plume" problem. As the input sulfur content affects the design and cost of the scrubbers, the utilities in the southeast do not appear disposed to incorporate sulfur flexibility into the scrubber design. If utilities do not spec their scrubbers to allow for higher sulfur coals, Illinois Basins may be precluded from these units if and when a low cost solution to the blue plume problem is found and/or the differential between the cost of Illinois Basin and Appalachian coals is sufficient to justify the cost of chemical additives and/or the retrofit of wet ESP's.

If the Illinois Basin is not able to be used in this "new" market, much of the future anticipated market for the Illinois Basin will not materialize.

The Illinois Basin still has growth prospects with new plants located mine mouth, as planned by Peabody Energy at Prairie State, or near to the basin, as planned by City of Springfield (Illinois). While significant perhaps in the long-term, the additional volumes added by these new units pale in comparison to what might have been if the southeast utilities do not provide for the potential of higher sulfur coal use in their scrubber designs.

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