

## Recent Trends in Bituminous Coal Production in Pennsylvania

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During approximately the last two hundred years the bituminous coal fields of Pennsylvania have produced 8 billion tons of coal. Only in the last few decades has any other state exceeded Pennsylvania in annual output. No state has exceeded or is likely to exceed the record production for one year achieved in 1918, when 180,000,000 tons were produced. In 1959 the bituminous coal industry in Pennsylvania employed 37,337 men. These 37,000 men produced 65,627,585 tons of coal. Now 37,000 men employed in one industry in one state sounds like a lot of men, and 65,000,000 tons of coal sounds like a lot of coal. However, if we look back into history, we find a different picture. To find a year comparable to 1959 in the number of men employed we must go back to 1881, when 35,530 men were employed; production was approximately 16,000,000 tons. To find a year comparable in production, we have to go back to 1898, when 64,000,000 tons of coal were mined by 88,000 men.

Almost everyone is familiar with the over-all production trend in the coal industry. Since World War II, when the coal demand was stimulated by a war-orientated economy, there has been a steady decline in production. In 1944 production was 144,000,000 tons. This amount was produced by over 100,000 men. After a small decline in 1945 and 1946, production in 1947 was over 145,000,000 tons and employment was up to 110,000 men. Since 1947, except for the Korean War years 1950-51, production and employment has shown a marked over-all decline.

However, to get a better picture of what has happened in recent years, it is necessary to take a closer look at a number of facts.

### (1) *Production.*

Production in Tons	
1954 .....	72,010,000
1955 .....	85,700,000
1956 .....	90,300,000
1957 .....	85,400,000
1958 .....	67,700,000
1959 .....	65,600,000

Examining these figures we can see some increase from 1954 to 1956, but then from 1957 to 1959 there is a marked decline in production. This fluctuation can be explained by the fact that the total energy production from mineral fuels in the United States was the highest in history during 1956. The use of all mineral fuels showed an increase during the 1954-56 period, but the use of coal increased at a much smaller rate than the use of oil and gas.

Since 1947, domestic consumption of coal has dropped sharply. A contraction of the over-all economy, a greater efficiency in mineral fuel use, and a smaller percentage of energy being coal produced accounts for this decline.

(2) *Employment.*

## Number of Men Employed

1954 .....	55,000
1955 .....	52,000
1956 .....	50,000
1957 .....	47,000
1958 .....	41,000
1959 .....	37,000

Even during the 1954-56 period of production increase, employment decreased and during the 1957-59 period of production decrease, employment declined at an accelerating rate. This employment trend can be explained by increased efficiency.

(3) *Efficiency.*

## Tons Per Man Per Day

1954 .....	7.71
1955 .....	8.23
1956 .....	8.58
1957 .....	8.85
1958 .....	9.38
1959 .....	10+

Two major items have brought about this increase in the amount of coal one man can produce in one day. First, the percentage of coal which is produced by strip and auger mining methods has been gradually increasing. Secondly, there has been a general rise of efficiency in underground mining methods. To determine the relative importance of these two factors, let us look more closely at the available data.

In 1954, 76.4 per cent of all coal output in Pennsylvania was produced in deep mines, 23.2 per cent was taken from strip mines, and 0.4 per cent from auger mines. In 1958, 70.5 per cent represented deep mine production, 29.1 per cent was derived from strip mines, and, again, 0.4 per cent came from auger mining operations. A shift in the type of mining of six per cent of the total takes on significance when it is pointed out that while the production per day per man in a deep mine is between six and seven tons, it will go as high as fourteen to fifteen tons at an auger mine, and even up to twenty tons in a strip operation.

Also, in 1954, 97 per cent of all coal produced in deep mines in Pennsylvania was mechanically mined; in 1958, 98 per cent was mechanically mined. The small increase here is relatively unimportant. What is significant is the change in the type of mining machinery used. From 1954 to 1958 the percentage of coal mined by the continuous miner has risen from 14 to 46 per cent. In 1954, 86.2 per cent of coal produced in underground mines was loaded by machine and 13.8 per cent was hand loaded. By 1958, 92.7 per cent of the coal was mechanically loaded and only 7.3 per cent was loaded by hand.

These factors have been the main reasons for the increase in production in tons per day per man. In the over-all picture the most important feature seems to be the change and increase in mechanization, with the rise in the percentage of coal taken by strip mining operations being of secondary importance.

(4) *Price of Coal.* In 1954 the price per ton at the mine was \$5.26; in 1958 the cost had only risen to \$5.52. This small increase is below the

national price scale index, so that in "real dollars" the cost of a ton of coal had actually decreased. One of the major cost factors in a ton of coal has been the cost of labor. In 1954 the average miner (not including men in supervisory positions) made \$80.85 per week at an hourly rate of \$2.48 per hour. By 1958, the same miner was making \$102.65 per week at an hourly rate of \$3.02. It should be pointed out that these wages are the national average and that the Pennsylvania average is somewhat higher. It is also worth noting that to earn the \$102.00, the miner had to work only 34 hours a week, or about four days.

It is obvious that the wages of the miner have not increased at the same rate as the price of coal. One of two things has offset the wage increase; either the companies are making less money per ton or the increased mechanization has reduced the over-all production cost. The real reason is likely a combination of the two.

To sum up what has happened in the bituminous coal industry in Pennsylvania during the years from 1954 to 1959 a few general statements can be made. First, almost all of the coal produced in the state is consumed in the state. Production depends for its market on electric power plants, the steel industry, the railroads, and residential fuel. While the amount of coal used in the production of electric power has actually increased, the use of coal by railroads has dwindled to almost nothing, demand from the steel industry has fluctuated with the national economy, and the use of coal for local, residential fuel has declined drastically. It seems odd to visit the home of a miner and hear his complaints about hard times in the coal mining industry, while he heats his home with a gas or oil furnace.

Secondly, there is an over-all trend consisting of a decrease in production, even though some increase took place between 1954 and 1956. Total employment has decreased at a greater rate than production because of the increase of efficiency in underground mining and a small rise in the percentage of coal produced from strip mines.

In the third place, while the price of coal has remained relatively stable, and the "Real Dollar" value has actually declined, the pay of the miner has increased by more than twenty per cent. This rise in wages has been compensated by increases in mining efficiency and a decrease in mine-operator profit.

Finally, most of the losses of market have been to the oil and gas industries. Coal, at present, is in poor condition to compete in some fields.

What is happening now? Until production figures come out for 1960, it will be hard to get an over-all picture of what is happening in the state. However, in sections of the state with which I have some familiarity, things look dark. All indications are for a marked decline from 1959's level of production. In some areas, mines are closing down completely. One of the large mines in Cambria County (the second-largest producing county in the state), situated in a company town, has shut down. By a "company town" is meant a town made up of company-owned houses, land, stores, and a mine. At this mine, the company sold the houses to the miners, then closed the mine and shut down the store. The mining operations was shipped to another area. The mine employed between three and four hundred men, and the way in which it was closed appears final. In this same district, which two years ago had nine deep mines operating, only three are producing at the present time. However, this is only one section of the state, and the over-all picture may not be as bad.

What does the future hold for the industry? There are two sides to every picture, so let's look at the dim side first.

If the present trend continues, the oil and gas industries will cut more and more into the coal markets. In the foreseeable future nuclear power may take a large part of the coal industry's biggest market — thermal-electric demands. Already a plant is in operation at Shippensport, Pennsylvania. Along the same line, there are indications of a major shift to a greater use of electric furnaces in the iron and steel industry.

However, there is a bright side to the same picture. There seems to be hope for the coal industry in two fields.

(1) *New Methods.* High-pressure water jets have been successfully used abroad for the extraction of coal. In the United States a site has been selected and equipment has been purchased to experiment with this method. A remotely controlled continuous mining system, in which the mining machine is activated from a central electronic control, is in final development. The use of a pipe line to transport coal to market could greatly reduce transportation costs. A 108 mile-long pipe line is already in use in Ohio. With a reduction in cost brought about by new methods, coal would be in a better position to compete in the open market.

(2) *New Uses.* A process to partly oxidize coal to produce acetylene for use in making synthetic fibers of the orlon type has been developed. The possibility of using coal as a fuel for diesel engines is being explored. Research in the methods of manufacturing liquid and gaseous fuels from coal is being conducted. When the conversion process becomes feasible, great quantities of coal will be needed.

King Coal may be down, but he is not out yet.

#### SELECTED SOURCES

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The Pennsylvania Department of Mines and Mineral Industries, Bituminous Coal Division, Annual Report, 1954, 1955, 1956, 1957, 1958, 1959.