

1995 Annual Review and Forecast of

UTAH COAL

Production and Distribution

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Executive Summary

While Utah and the U.S. each set a new coal production record in 1994, Utah continued its production increase in 1995 by producing 2.5 percent above 1994. U.S. production, however, decreased by a fraction (less than 0.4 percent) compared to the record year of 1994. Utah's 1995 production of 25.051 million tons was an impressive gain over the 1994 figure of 24.422 million tons - a 0.629 million ton increase. Some coal producing states east of the Mississippi, such as Alabama and Oklahoma, had considerable increases while, as a whole, these states had a decrease of 4.2 percent as compared to 1994. States west of the Mississippi also registered decreases with the exception of Utah and Wyoming. It was the strength of the increase in production from these two states (more from Wyoming than Utah) that led to the total increase of western production to top 4.3 percent as compared to 1994.

Utah distributed 25.4 million tons of coal, exceeding 1994's record year by two million tons. This occurred despite the closure of the Sunnyside Mine. The major contributors to this surge in distribution were the electric utilities outside of Utah with an increase of 1.7 million tons, as well as exports outside of the country with an increase of more than one million tons.

During 1996, both produc-

tion and distribution should **break through the 27 million ton mark** and set new all-time records.

Utah's coal mines remain the most productive underground mines in the United States. Productivity of Utah mines, just under two tons per miner-hour (tpmh) in 1980 and 1981, has been on the rise ever since, reaching new highs almost every year. In 1995, Utah's mines achieved a new record of 6.94 tpmh, 11.6 percent higher than the record year of 1994. In 1996, the industry expects another record to be established, though by a fraction.

This high productivity is largely credited to excellent management skills, a capable engineering and geological staff, a high degree of mechanization and a highly skilled workforce. These factors have led to more competitive coal prices for Utah's coal mines that, in turn, have enhanced and guaranteed the success of the coal industry in the state.

Electric utilities consumed the bulk of Utah's coal production. The Hunter, Huntington and Carbon Plants of Utah Power and Intermountain Power Agency's (IPA) Intermountain Power Plant (IPP) purchased 11.665 million tons and consumed 12.173 million tons in 1995. Together these four plants purchased 46.6 percent of all coal produced in Utah, making the electric utility sec-

tor Utah's best coal customer. Deseret Generation and Transmission's Bonanza Plant consumed 0.8 million tons of Colorado coal and 0.106 million tons of Utah coal. Also in 1995, electric utilities and cogeneration plants outside of Utah consumed 6.57 million tons of Utah produced coal. Altogether, electric utilities in the United States consumed 73.2 percent of the coal produced in Utah. Including those volumes exported to the Pacific Rim, electric utilities consumed 88.4 percent of all the coal produced in Utah.

During 1995, Utah purchased and consumed various amounts of coking coal from outside of Utah. These imports amounted to 1.062 million tons; additional imports were required since Utah ceased production of metallurgical coal in 1994.

In 1995, the industrial coal consumption was Utah's third largest consuming sector. Kennecott consumed 56 percent of 0.64 million tons of Utah's industrial coal. Various cement and lime plants in Utah consumed the balance. The out-of-state industrial consumption of Utah coal amounted to 2.4 million tons in 1995 and was used primarily by chemical and cement plants in California and cement plants in Nevada; about 0.2 million tons went to the midwest.

Far behind the industrial sector, residential and com-

mercial customers consumed almost 0.25 million tons.

Finally, the Pacific Rim countries of Japan, Korea and Taiwan consumed some 3.81 million tons of Utah coal, primarily for electric power generation. This market is expanding and should account for more than five million tons in 1996.

Utah Coal Production

Production of coal in Utah increased to more than 25 million tons, by far the highest production level in 126 years of recorded production. Gross production topped 25,726,000 tons and net production came in at 25,051,000 tons (Appendix, Table 1).

Though 1995 production outpaced the previous year, employment declined by 1.7 percent, thereby increasing productivity by 11.6 percent. As a result, Utah's miners retained their status as the nation's most productive. Productivity in 1994, already 14.6 percent above 1993, increased another 11.6 percent in 1995.

During 1995, a total of 1,989 miners produced 25,051,000 tons of coal. Working an average of 225 days per year (447,525 miner days), miners produced an average of 6.94 tons per miner hour (Appendix, Table 1), a figure more than 11.6 percent higher than 1994's 6.22 tons per miner hour (note: those figures are based on net production). On the basis of gross production, productivity was even higher. Such increases in productivity may be expected of a low productivity operation which has been overhauled and streamlined. It must be emphasized that this level of increased productivity is a remarkable achievement for a group of miners already at their peak performance.

The Wasatch Plateau coal

field was again the major coal producer in 1995. More than 90.3 percent of Utah's 1995 coal production - 22.6 million tons - came from this field while the Book Cliffs accounted for the remaining 9.7 percent or 2.4 million tons. The Emery coal field, the only other significant producer in recent years, did not produce any coal between 1992 and 1995. During 1996, the Wasatch Plateau coal field is expected to produce a record of 24.2 million tons, representing 88.5 percent of total production. In contrast, about 3.15 million tons or 11.5 percent of Utah's coal production

On a county basis, the majority of Utah's coal production is now shifting from Carbon County to Emery County. Sevier County's 1995 production remains stable, but ranks second, just above Carbon. As Skyline Mine of Coastal States Energy and Starpoint Mine of Cyprus Plateau shift their production from leases in Carbon to those in Emery County, the balance of coal production by county shifts dramatically from Carbon to Emery since these two mines combined account for about 31 percent of total coal production in Utah: the actual shift by both mines

Utah Coal Industry Production, Employment, Productivity and Prices

	Production Million Short Tons	Employment No. of Employees	Productivity Tons/Miner Hour	Prices \$/Ton
1981	13.80	4,166	1.99	26.87
1982	16.91	4,296	2.05	29.42
1983	11.82	2,707	2.59	28.32
1984	12.25	2,525	2.94	29.20
1985	12.83	2,563	2.80	27.69
1986	14.26	2,881	3.08	27.64
1987	16.52	2,650	3.25	25.67
1988	18.16	2,559	3.69	22.85
1989	20.51	2,471	4.42	22.01
1990	22.01	2,791	4.22	21.78
1991	21.87	2,292	4.79	21.56
1992	21.02	2,106	5.13	21.83
1993	21.72	2,161	5.43	21.17
1994	24.44	2,024	6.22	20.07
1995	25.05	1,989	6.94	19.11
1996	27.34	2,013	6.95	18.75

1996 values are forecast

is expected to come from the Book Cliffs coal field. For the fifth year in a row, no production is likely from the Emery coal field (Appendix, Table 2).

started in 1991, became more pronounced in 1992, and almost completed itself in 1993 (Appendix, Table 3). Skyline Mine production,

however, will most likely shift back to Carbon County within two years, resulting in more production from Carbon County leases than Emery County. As compared with the Skyline Mine, the Starpoint Mine shift is expected to be more accelerated. This shift may be even more pronounced as Cyprus Plateau moves its coal operation from Starpoint Mine to Willow Creek Mine, located entirely in Carbon County.

The volume of coal mined from federal leases during 1995 increased to a record high of 23.7 million tons. Its contribution as a percentage of total state production also increased because of a decrease in production from state lands. Never before has so much coal been produced from federally-owned land on a tonnage basis (23.7 million tons) or as a percent of total production (94.7 percent) than in 1995.

State lands production had not reached the one-million-ton mark since 1980. In 1992, production easily surpassed this level with 1,384,000 tons of coal produced and again in 1993 with a record of 1,682,000 tons of production. In 1994, production from state lands decreased to 1,227,000 tons, a figure still higher than at any time in the 1980s. During 1995, production from state lands was cut to less than half of 1994 level. As a percentage of total production, state lands resources have accounted for only between one to five percent, which increased to above six and

seven percent in 1992 and 1993; in 1994, it fell back to five percent. During 1995, state land production registered the second lowest percentage production level since 1980.

Production from county land has always been minimal and erratic. During 1995, county-owned lands produced 289,000 tons, amounting to 1.2 percent of total production.

For the first time in a decade coal production from fee lands slipped below two million tons (1.735 million tons) in 1992. In 1993, production decreased again by 50 percent to 826,000 tons, still falling in 1994 to 415,000 tons or 1.7 percent of total production. During 1995, production from fee lands stayed at close to the same percent of production (1.8 percent) as in 1994; on the tonnage basis production went up by 11 percent compared to 1994. By contrast, coal produced from fee lands in 1983 amounted to almost 40 percent of total production (Appendix, Table 4).

During 1995, eight operating longwall panels accounted for 72 percent of production or 17,954,000 tons. This amounted to an average of more than 2.25 million tons of coal production per-panel, per-year. Twenty-five continuous miners produced a total of 7,097,000 tons of coal for an average of 284,000 tons per-machine, per-year. In recent years, however, some machines have produced between 400,000 to almost 600,000 tons per year.

Utah Coal Markets: Distribution of Utah Coal

Distribution of Utah coal, which during 1990 to 1993 had been relatively unchanged, and remaining within a one percent range of 21.6 million tons, jumped by 6.9 percent during 1994 above 1993 levels; another substantial increase of 8.5 percent in 1995 above 1994. Distribution of coal hit an all-time high of 23,441,000 tons in 1994 but 1995 distribution surpassed this level with 25,443,000 tons, an increase of more than two million tons. Never in the 126 years of Utah's coal industry has so much coal been distributed as in 1995. Distribution of Utah coal to consumers in Utah stood at 12,595,000 tons. The distribution to consumers in other states totaled nine million tons, about 1.5 million tons more than in 1994. Overseas exports amounted to 3,811,000 tons, about 1.1 million tons above the 1994 export level.

Electric Utility Markets

It has been more than two decades since electric utility consumption of coal surpassed "other industrial coal" and "coke plant coal" consumption to become the number one market for Utah coal operators. Today, more than 73 percent of Utah's coal production is consumed to generate electricity in Utah and other states. Including exports, about 88.4 percent of Utah's coal production is consumed to generate electricity.

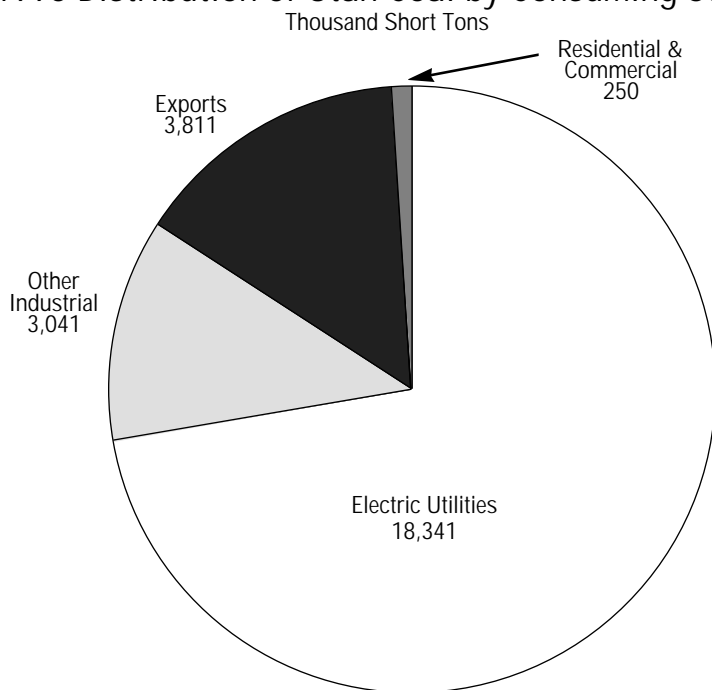
Out-of-State Markets

Distribution of Utah coal to out-of-state markets during 1995 increased by 37 percent over the 1994 level. Utah shipped a total of 6.57 million tons and has never before sold this much coal to out-of-state electric utility/cogeneration customers. Almost half of this shipment went to coal-fired

detailed in the 1994 coal report. The total shipment to these two states increased ten-fold.

Indiana and Kentucky did not receive any coal from Utah in 1995. Shipments to Missouri dropped by seven percent (from 418,000 tons to 389,000 tons) while sales to Oregon increased by 85 per-

1995 Distribution of Utah Coal by Consuming Sector



power plants and cogeneration facilities in Nevada and California. Illinois and Tennessee received the lion's share of Utah's electric utility coal to the east. Coastal and White Oak were the major shippers of coal to Illinois while White Oak and Genwal supplied the entirety of the shipment to Tennessee in compliance with the contract

cent (from 101,000 tons to 188,000 tons). Utah Power did not ship any more coal to Washington state and the other shipments to Washington were also reduced, while Wisconsin became a newcomer in receiving coal from Utah. In fact, Pennsylvania is on record as having received a small amount (Appendix, Table 5).

In Nevada, three electric

power generation facilities burn bituminous or subbituminous coal. Two of these plants, the Nevada Power Company's Reid Gardner Plant and Sierra Pacific Power Company's North Valmy Plant, also burn Utah coal.

Nevada Power's Reid Gardner Plant, rated at 636 megawatts (MW), purchased a total of 1.629 million tons of coal and burned 1.426 million tons of coal for a net generation of 2,946 gigawatt hours (GWh) of electricity. Approximately 1.384 million tons of this purchase came from Utah with the remaining 0.245 million tons coming from Colorado. Before 1993, Reid Gardner's four units relied almost entirely on Utah coal. One of Nevada Power's four major contracts with Utah coal producers was with Arco, which originally supplied the coal from its Gordon Creek Mines and, later, from its Trail Mountain Mine. In September 1992, Arco sold Trail Mountain to PacifiCorp but continued to fulfill its contractual obligation to Nevada Power from its stock-pile in Utah and through local purchases. However, between 1993 and 1995, Arco fulfilled the major portion of its obligation from its West Elk Mine in Colorado. During 1996, Nevada Power's sale should increase by three percent.

The two units of the Sierra Pacific Power Company's North Valmy Plant have a combined generation capacity of 521 MW. In recent years, Sierra Pacific Power

Company and Washington Water Power Company had discussed a merger and a petition was pending before the Federal Energy Regulatory Commission (FERC). Were this merger approved by state and federal regulatory bodies, the new company would have been called Resources West Energy Corporation. Of note, the two companies served customers in five different states and the Public Service Commissions of all five states had to approve the petition. The firms also agreed on a time table of events, which would have precluded the consummation of the agreement were it not met. Due to the turn of events beyond the control of either side, the time table was not met and the agreement of merger was left in abeyance.

The North Valmy Plant requires about 1.45 million tons of coal per year; Utah and Wyoming mines share equally in supplying the requirements for this plant on a Btu basis. Since the Btu content of Utah coal is higher than Wyoming coal, the percent-by-weight of the Wyoming coal is somewhat higher. In 1995, Utah coal shipments to the North Valmy Plant totaled 0.64 million tons, which represented an increase of 5.3 percent over 1994. Sierra Pacific purchased an additional 0.3 million tons of coal from Black Butte Coal Company near Rock Springs, Wyoming.

In 1995, the two units of North Valmy Plant had an average availability of 94.5

percent and a capacity output factor of 40 percent. The units burned 0.953 million tons of coal to generate 1,855 GWh of electricity. During 1996, this plant is expected to generate about the same amount of electricity as 1995. Despite considerable reduction in electric generation due to greater availability of hydropower from the Northwest, and consumption of a much greater amount of natural gas for electric generation, the coal purchased from Utah increased by more than five percent. However, the coal purchased from Wyoming decreased by 70 percent.

Utah and Wyoming coal delivered to the North Valmy Plant are similar in price and quality; Wyoming coal is slightly less than Utah coal in price and Utah coal is slightly less in sulfur content and higher Btu content than Wyoming coal. The coal fields are of equal distance from North Valmy Plant though Utah's coal is closer by 30 miles. Neither coal source has ever demonstrated a large enough competitive advantage to allow the prudence of multi supply source policy to be overridden by small price considerations. However, the gradual accumulation of stock of one coal over the other may measurably affect the relative amount of purchases.

A third coal-fired electric utility plant, one that does not burn Utah coal, is the Southern California Edison Company's Mojave Power Plant near Laughlin, Nevada.

The Mojave Power Plant has a combined nameplate generation capacity of 1,636 MW and consumes about 4.2 million tons of coal per year. This coal is currently shipped to the Mojave Plant through a 273-mile, 16- to 18-inch slurry pipeline from the Black Mesa-Kayenta Coal Mine complex near Kayenta, Arizona. Coal received at this plant in 1995 was more than 4.8 million tons. At this time, Black Mesa coal is probably the plant's only viable coal supply. However, competition for a share of Mojave's coal supply could occur if, and when, coal from Utah's southern coal fields is developed.

In addition to Nevada's electric utilities, more than 1.15 million tons of Utah coal went to cogeneration facilities in California. The Energy Information Administration, in adhering to a more restricted definition of electric utility and other industrial coal consumption, classifies cogeneration consumption under the definition of other industrial coal. For purposes of this report, coal shipped for consumption in cogeneration facilities is considered electric utility consumption, since its main purpose is to generate electricity for sale.

The electric utility market for Utah coal presently includes six coal-fired cogeneration units operating in California. Stockton, California, is the site of the first coal-fired cogeneration facility ever to burn Utah coal. This unit is operated by Air

Products & Chemicals, Inc. and began commercial operation in March 1988. This 49.9 MW unit is capable of consuming 220,000 tons of coal per year to generate about 425 GWh of electricity. In 1995, this plant purchased 177,000 tons of coal, all of which came from Utah and generated a total of 450 GWh of electricity. Some of the electricity and all of the steam by-product were used by an adjacent corn wet milling plant owned by Corn Products Co. International. Pacific Gas and Electric Co. (PG&E) purchased the remainder. During 1996, this plant will purchase 160,000 tons of coal and is planning to generate 485 GWh of electricity, 440 GWh of which will be sold to PG&E.

In May 1989, a second coal-fired cogeneration facility was commissioned. It is owned by Mt. Poso Cogeneration Co., a consortium of Ahlstrom Development Corp., Pacific Generation Co., and Bechtel Enterprises Inc. This 49.9 MW plant is located in the San Joaquin Valley and is operated by Pyropacific Operating Company and Pacific Generation Company. During 1995, operators purchased 217,000 tons of Utah coal and burned the same amount to generate 456 GWh of gross and 402 GWh of net electricity that was sold to PG&E. The operations in the Mt. Poso Field-West used the steam by-product for enhanced oil recovery. During 1996, this unit will consume one percent less coal and gen-

erate one percent less electricity.

The largest coal-fired cogeneration facility in California, with 96 MW of installed electric generation capacity, is owned by ACE Cogeneration Co., which is in turn, owned by Ahlstrom Development Corp., Constellation Holding, Inc. and Kerr McGee Chemical Company. This unit is located in Trona, California and started operation in September 1990. North American Chemical Company's two soda ash plants adjacent to the ACE Plant use the steam by-product. This unit has the capacity to burn 300,000 to 350,000 tons of coal per year to generate between 650 to 750 GWh of electricity. During 1995, the firm purchased 367,000 tons of Utah coal and burned 374,000 tons to generate 837 GWh of gross electric generation. Southern California Edison Co. purchased the net 759 GWh of electricity. This unit is expected to burn about four percent less coal during 1996.

Ultra Power, Constellation and Hadson are the owners of a twin cogeneration plant in Bakersfield named Rio Bravo Poso and Rio Bravo Jasmin. Construction of this twin plant started on December 28, 1987 and was completed on March 23, 1990. The plant started commercial operation on September 27, 1989 and it went on-line early in 1990.

During 1995, Rio Bravo Poso purchased 108,000 tons of Utah coal, burning about

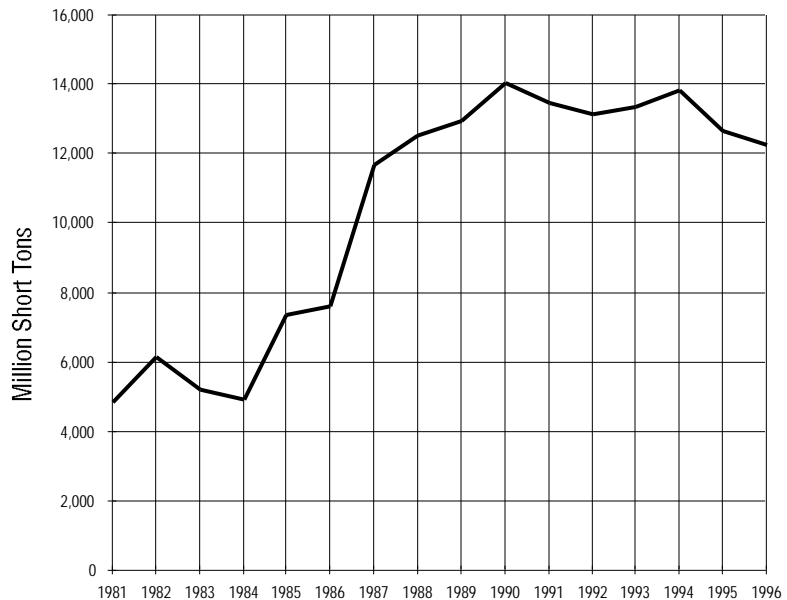
104,000 tons to generate 287 GWh of electricity, which was ultimately sold to PG&E. The Rio Bravo organization used the steam by-product in its oil field for enhanced oil recovery operations. During 1996, this plant will consume the same amount of Utah coal as in 1995. Rio Bravo Jasmin purchased 106,000 tons of Utah coal and burned 105,000 tons to generate 278 GWh of electricity that was sold to Southern California Edison. The Rio Bravo oil field also used the steam by-product of this unit for enhanced oil recovery. During 1996, this plant is expected to purchase and burn a slightly higher amount of Utah coal, as compared with 1995, and generate close to the same amount of electricity.

Another cogeneration plant, Energy Factor, is located in Stockton. This 45 MW cogeneration plant was first bought by Sithe Energy in 1990 and then sold to a partnership of National Power Company and ESI in 1993. ESI, a wholly owned subsidiary of Florida Power Company, originally backed this transaction, but later decided to take a more active role in the plant's daily operation. This plant is now operating under the name of Port of Stockton District Energy Facility (POSDEF) Power Company L.P. The steam by-product from this plant goes to three processing facilities within the same industrial complex: California Cedar Products, which manufactures cedar wood products includ-

ing Dura Flame logs; and Cargil and Liquid Sugar that each import raw sugar from Hawaii and manufacture various food products for human and animal consumption. This cogeneration unit can use about 200,000 tons of coal per year. The coal supply contract for this company is with Pacific Basin Resources, a division of Oxbow Carbon & Minerals of Colorado. During 1995, this company purchased 176,000 tons of coal, all of which came from Utah. This unit consumed 176,000 tons

sumption by electric power plants in Nevada are expected to decrease by five percent from 1995's total to 1.92 million tons in 1996. During 1993, the amount of coal sold to electric utilities within the U.S. excluding Utah, Nevada and California - the main users of Utah coal - nearly doubled from 556,000 to 1,087,000 tons. During 1994, this consumption reached 1,710,000 tons, more than 200 percent over 1992 and about 60 percent over 1993. In 1995, this consumption shot up to

Distribution of Coal to Utah Electric Utilities



1996 values are forecast

of coal to generate 377 GWh, of which 329 GWh (of net electric generation) was sold to PG&E. In all likelihood, for the foreseeable future, all of the requirement of this unit will be supplied solely by Utah.

Shipments of coal for con-

3,395,000 tons, which was almost twice that of 1994. States receiving electric utility coal from Utah included: Illinois (1,546,000 tons); Tennessee (1,118,000 tons); Missouri (389,000 tons); Oregon (188,000 tons); Wisconsin (94,000 tons); Washington (51,000 tons); and

Pennsylvania (9,000 tons). During 1996, this consumption should increase by 36 percent from 3,395,000 tons to 4,606,000 tons. As a result, Utah coal distributed to other states for electricity generation is expected to increase from 6.57 million tons in 1995 to 7.7 million tons in 1996.

Utah Markets

Coal consumed in Utah to generate electricity amounted to nearly 13.26 million tons in 1995, which fell below our expectations; in point of fact, coal shipped to electric utility plants was only 12.55 million tons. Utah Power's Hunter I, II, and III, with availability of 93.86 percent and utilized availability of 99.44 percent, consumed 4.38 million tons of coal mostly from PacifiCorp's Cottonwood Mine and some from Deer Creek Mine to generate 10,015 GWh of electricity. During 1996, this plant should be working at about one percent lower availability, and four percent lower utilized availability than in 1995, resulting in slightly less coal burned and four percent less electricity generated.

Huntington I and II, with plant availability of about 92.76 percent and utilized availability of 99.19 percent, consumed 2.91 million tons of coal produced from PacifiCorp's Deer Creek Mine to generate 6,810 GWh of electricity. During 1996, this plant should be working at 93.11 percent availability and 99.92 percent utilized availability, resulting in about six percent more coal burn and

two percent higher electricity generation. The Carbon Plant, with availability of 94.35 percent and utilized availability of 93.54 percent, consumed more than 633,000 tons of coal to generate 1,353 GWh of electricity. The coal for this plant was produced by Deer Creek Mine of PacifiCorp. It is very likely that the capacity factor for Utah Power's three plants could be slightly higher in 1996 than in 1995, and coal consumption could increase from 7.924 to 8.125 million tons. In 1996, coal production for distribution to Utah electric utilities is likely to decrease while the consumption of coal would increase, which means that Utah Power would reduce its stockpiles by a greater amount as it did in 1995.

The Intermountain Power Plant (IPP), of Intermountain Power Agency (IPA), with availability of 94.95 percent, operated at utilized availability of 94.1 percent during 1995. The two units of this plant, with the total nameplate capacity of 1,640 MW, burned 4.25 million tons of coal to generate 10,344 GWh. States outside of Utah consumed all the generated electricity. During 1996, this plant will burn approximately 4.5 million tons of Utah coal to generate 11,600 GWh of electricity, all of which will be sold outside of Utah. The warm winter of 1994/95 negatively impacted the coal sale of early 1995 and it has decreased steadily through the year. The higher availability of hydropower in the Northwest

also caused a decrease in coal burned during the Spring and Summer of 1995.

During 1995, Deseret Generation and Transmission's (DG&T) Bonanza Plant with the rated peak capacity of 420 MW, had an availability of 79.6 percent and a capacity factor of 64.17 percent. This plant consumed 1.094 million tons of Colorado and Utah coal to generate 2,337 GWh of electricity, of this total, 1,089 GWh or 46.6 percent was sold outside of the state. DG&T purchased 779,000 tons of coal from the Deserado Mine, located just 36 miles east of the plant in Colorado, and the remaining 106,000 tons were purchased from Utah producers. The total coal purchased in 1995 was 885,000 tons. During 1996 the availability will increase to 100 percent; the capacity factor should increase to 92 percent and the amount of coal consumed will be 1.546 million tons, resulting in 3,297 GWh of electricity generation, of which 56.2 percent or 1,853 GWh will be sold outside of Utah.

Utah Coking Coal Markets

The market for Utah-produced coking coal is limited to the Geneva Works Steel Mill in Orem, Utah, owned by Basic Manufacturing and Technology of Utah, Inc. Geneva Steel is the only integrated steel mill operating west of the Mississippi River. Located 45 miles south of Salt Lake City, the firm manufactures hot-rolled steel plate, sheet, and pipe for markets

primarily in the western and central United States. Geneva's customers include service centers, distributors, steel processors, and various end users which include: manufacturers of welded tubing; highway guardrail; storage tanks; railcars; ships; and agricultural and industrial equipment. Geneva is undergoing an extensive modernization program intended to enhance its competitive position by reducing operating costs, expanding product lines, improving quality, and significantly increasing throughput capacity. With these improvements in place, Geneva Steel will strengthen its position as a low-cost steel producer while becoming one of the industry's more environmentally advanced steel mills. The company acquired the steel mill and related facilities in a leveraged buy out from USX Corporation in August 1987. Coal purchased by Geneva Works to make coke totaled 1,062,000 tons during 1995. The plant consumed about the same amount of coal to make coke for steel production.

As the coke-making battery of Geneva Works ages its capacity decreases, thus limiting the plant's steel-making capacity. During 1995, Geneva overcame this constraint by directly purchasing 420,000 tons of coke, 25,000 tons from Japan and 395,000 tons from China in addition to its own manufactured supply, to produce about two million tons of steel. To meet its requirement of low- to mid-volatile hard coking coal,

Geneva Works has negotiated a long term contract with eastern producers and a five year, 500,000 tons-per-year transportation contract with Southern Pacific railroad.

During 1995, Geneva bought 215,000 tons of low-volatile Pennsylvania coking coal from Cooney Brothers Coal Company of Cresson, Pennsylvania. In addition, Geneva bought 328,000 tons of high-volatile Colorado coking coal from San Born Creek Mine of Oxbow Carbon and Mineral, Inc. (previously known as Pacific Basin Resources) of Littleton, Colorado. This coal is from the same seam as the coal Geneva purchased from the Bear Coal Company, Inc. of Somerset, Colorado, during 1991.

Geneva also bought 206,000 tons of mid-volatile Virginia coal from the United Coal Company of Bristol, Virginia, mostly from Lady H Mine. It also purchased and consumed 313,000 tons from Wellmore Coal Company of Virginia.

During 1996, Geneva will purchase the same amount of coal as in 1995. Geneva will purchase 212,000 tons of coking coal from Cooney Brothers, about 424,000 tons of coking coal from Oxbow Carbon & Mineral's San Born Creek Mine, 278,000 tons of mid-volatile coal from Wellmore Company of Virginia, and 146,000 tons

from Commonwealth Coal Company's War Eagle Mine situated some 20 miles away from Richmond, Virginia, in West Virginia.

Other Industrial Coal Markets

Out-of-state markets

Since 1989, when shipments of coal to other states for industrial consumption peaked at 2.4 million tons, consumption for this market sector has been on the decline, reaching only 2.0 million tons in 1992. During 1993, shipments increased for the first time in four years and in 1994 this trend continued as six operators shipped 2.32 million tons of industrial coal to ten states outside Utah; in 1995, there was a slight increase to 2.4 million tons. The largest recipient of industrial coal was California. More than 70 percent of all the industrial coal from Utah went to chemical and cement manufacturing plants in the Golden State. Nevada received 205,000 tons for use mainly in cement plants. This consumption was less than half of last year's. Shipment to Michigan amounted to 182,000 tons. Idaho shipments ranked fourth with 109,000 tons. Washington also purchased 86,000 tons, followed by Arizona with 80,000 tons, Wyoming with 22,000 tons, Colorado with 12,000 tons, Montana with 3,000 tons, and finally Oregon with 1,000 tons.

Utah Markets

In 1995, industrial consumption of coal in Utah decreased by less than one

percent to 642,000 tons from 647,000 tons the previous year. Kennecott Copper used more than one half of the total to generate electricity. During 1995, Kennecott purchased 359,000 tons of Utah coal and consumed 371,000 tons during an eight-month period to generate 773 GWh of electricity. During the other four months, Kennecott consumed a little more than 2.26 billion cubic

to 0.66 billion cubic feet.

The Devil's Slide Plant of Ideal Basic Industries has been a part of Holnam since 1986. A series of acquisitions and mergers had established Holnam, Inc. as one of the largest cement companies on the North American continent. Dundee Cement Company, Santee Cement Company, Northwestern States Portland

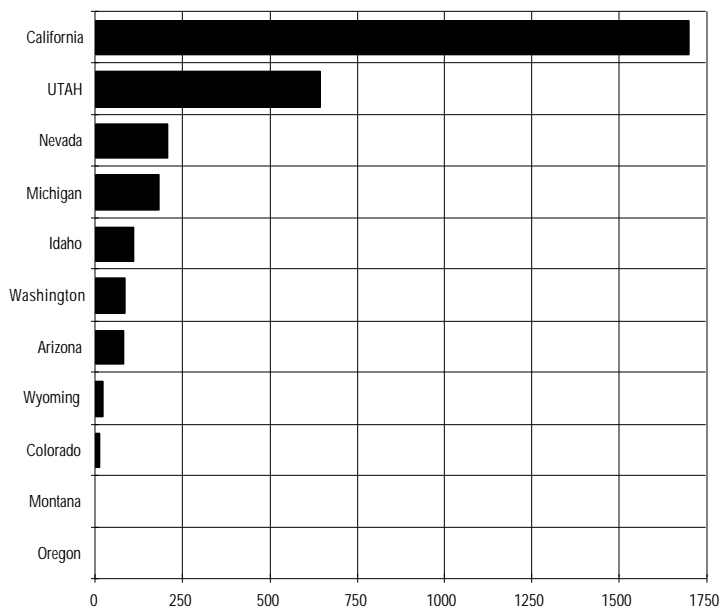
In 1986 "Holderbank" acquired a 66 percent interest in Ideal Basic Industries, Inc. a leading cement producer based in Denver, Colorado, which had run into some financial difficulties and required financial restructuring. The nine-plant Ideal Basic system fit in well with the Dundee Cement Co. system, offering new markets to the West, Southwest, and Mid-Central regions of the United States. The whole establishment, comprising 19 cement plants and 113 distribution terminals in most U.S. states and three provinces of Canada, is now referred to as Holnam.

Devil's Slide Plant switched from Wyoming coal to natural gas in 1991 and continued to burn natural gas until August of 1992. In August 1992, the price of natural gas increased to the point where coal consumption became more economically desirable. During the remainder of 1992 Devil's Slide Plant used 27,000 tons of coal. A significant event occurred when this plant converted from natural gas to coal; it did not automatically switch to Wyoming coal as it had in the past but, instead, started using Utah coal.

During 1993, Devil's Slide Plant purchased 60,000 tons of coal, 40,000 tons of which came from Utah with the remainder coming from Wyoming. In 1994, the coal purchased from Utah increased to 59,000 tons with only 4,000 tons of coal coming from Wyoming. By 1995,

Distribution of Utah Industrial Coal by State

Thousand Short Tons



feet of natural gas to generate 206 GWh of electricity. The coal consumption in 1995 jumped seven percent over the previous year's figure.

In 1996, Kennecott's coal fired generation will decrease by 9.5 percent and the natural gas generated electricity will be reduced to one third of the previous year. Total coal consumption will amount to 325,000 tons and natural gas consumption will be reduced

Cement Co., Ideal Basic Industries and United Cement Company have all been brought together under the Holnam banner. "Holderbank" controls 89.3 percent of Holnam's common stock. In the consolidation process "Holderbank's" share in St. Lawrence cement was brought into Holnam, which thus now holds a 60 percent interest in that company.

only Utah coal was purchased (25,000 tons), but the plant used 30,600 tons of coal - some from the stockpile - plus natural gas for summer use, treated tires and diaper plastics material which was obtained from Kimberly Clarke Plant in Ogden to produce 351,000 tons of cement. For 1996, this plant is expected to purchase and consume about 35,000 tons of Utah coal.

During 1995, Ashgrove's consumption of coal decreased by about 10 percent to 81,500 tons, due to a ten percent decrease in cement production. The economic benefits of consuming waste oil as a fuel substitute began to diminish as the price per Btu of waste oil approached that of coal; as a result, in 1995, Ashgrove did not use any waste oil. The consumption of used tires was cut down to 10 percent of the previous year due to operational problems encountered with this use.

Gypsum and Lime plant operators consumed nearly 170,000 tons of coal as well. Industrial coal consumption in Utah should increase by about five percent from 642,000 tons in 1995 to about 672,000 tons in 1996.

Residential and Commercial Coal Markets

Out-of-state markets

Since the mid-1980s when consumption stabilized at about 300,000 tons per year, demand for residential and commercial coal has been on

the decline. By 1990, it stood at only 59,000 tons, its lowest level. In 1991, sales to the residential and commercial sector increased to 76,000 tons and in 1992, to 81,000 tons. During 1993, out-of-state consumption jumped by 63 percent to 134,000 tons; by 1994, this sector consumed 308,000 tons. This unusual increase was due mainly to consumption of 193,000 tons by Illinois, which did not buy any Utah coal in 1995. As a result this consumption was decreased to 68,000 tons in 1995. Washington and Idaho bought significant quantities. In contrast, Montana, Colorado, Oregon and Nevada purchased relatively small amounts (Appendix, Table 5). Consumption by the residential and commercial sectors in these states will probably increase in the short term though with some fluctuations. For 1996, a decrease of about 7.5 percent is very likely.

Utah markets

During 1995, residential and commercial coal use in Utah increased by 16 percent to 182,000 tons. This level of consumption was still one of the lowest in the past 15 years. Only in 1994 and 1982 was there less consumption in this sector. In some counties such as Emery, Wayne, Millard, Juab, Sanpete, Sevier and Carbon the percentage of homes using coal for heating is between 15 to 20. In comparison, the Wasatch Front counties of Salt Lake, Utah, Weber and Davis use very little coal for home heating.

Commercial consumption of coal for space heating in Davis, Weber and Salt Lake counties is also low.

Two elements affect residential and commercial consumption. One includes the environment standards set by various air quality control agencies; the other is the cost of the fuel. From 1987 to 1992 natural gas declined in price and became very competitive with coal on a price per-million-Btu-delivered basis. As a result, many consumers switched to natural gas. However, in late 1992 and thereafter, increases in the spot price of natural gas provided an economic incentive for some consumers to switch back to coal. Therefore, Utah coal producers might not see another increase in out-of-state consumption of Utah coal by residential and commercial markets unless the price of natural gas is increased again. For 1996, this consumption would fall further down to about 163,000 tons with 60 percent consumption in Utah and 40 percent out-of-state.

Coal Imports

Utah imports coal for coking applications and a coal-fired power generation plant in Uintah County. There are no imports bound for the industrial and residential and commercial sectors. In 1995, companies operating in Utah imported 1.84 million tons of coal.

Utah previously imported low- to mid-volatile hard cok-

ing coal to mix with its own high volatile coking coal for the Geneva Steel Mill. Since February of 1994, when the coal supply contract between Geneva and Sunnyside Reclamation and Salvage Company expired, Utah has relied entirely on out-of-state coking coal and coke for steel production, thus accounting for the major increase in the amount of imported coal to Utah. Imports of industrial coal to Utah were used primarily at Devil's Slide Plant located in Morgan near the Wyoming border. However, this plant's consumption is now being met by Utah coal, and further imports to this plant were ceased in favor of Utah coal. The only other coal import to Utah is about 1.0 million tons of electric utility coal used in Deseret Generation and Transmission's (DG&T) Bonanza Plant. Compared to 1994, coal shipped to Utah from mines in other states decreased by 29 percent in 1995. This occurred due to lower consumption of out-of-state coal by the Bonanza Plant as well as Geneva Steel Mill.

The Bonanza Plant purchased 0.8 million tons of coal from Colorado and for the first time augmented its consumption with Utah coal in 1995. In 1996, imports may rebound as the Bonanza Plant resumes a higher level of generation, while Geneva Works coal imports should stay at the 1995 level. Ideal Basic Industries' Devil's Slide Plant purchased a little more than

9,000 tons of Wyoming coal when it switched from natural gas during the second half of 1992. During 1994, this plant purchased 4,000 tons of industrial coal from Wyoming and in 1995 it did not purchase any at all. Furthermore, the firm is not expected to purchase any Wyoming coal in 1996.

There is no indication that coal will be imported into Utah for use by the residential and commercial sector in 1996. Altogether, the imports of coal into Utah are expected to increase to 2.11 million tons in 1996 from 1.84 million tons in 1995.

Overseas Exports

Utah coal exports to overseas markets during 1995 were quite encouraging, surpassing all previous exports including the 3.472 million tons of 1981 which stood as an export record for 13 years. The number of Utah mines exporting coal in 1995 stayed at six, but coal exports increased by more than a million tons to 3.811 million tons.

Utah is uniquely situated in the coal export market. Its low cost, low sulfur and high Btu coal is closer to West Coast ports for shipment to Pacific Rim countries than any other U.S. coal source. In the past U.S. coal exceeded the cost of other coals in the Pacific Rim region, though offering several quality advantages such as high Btu and low sulfur content. In addition to the coal quality, U.S. coal producers are considered the

most reliable; an attribute of Utah's coal that Pacific Rim countries value very highly.

The cost of production and price of Utah coal steadily decreased over the past decade, largely a result of increased productivity. Because of this productivity, Utah coal is nearly as competitive on a price-per-million Btu basis as coal produced in other countries. Indeed by 1995, Utah coal became quite competitive with Australian and other coals in the Pacific Rim. For example, Australian coal producers in negotiations with Japanese traders in 1994 managed to negotiate a five to six dollar increase for their export coal; Utah coal producers received a two dollar increase. This difference in the amount of adjustment between the Australian and the American coal was large enough to prompt interest in Utah coal. In fact, this small increase was enough to yield an FOB mine mouth for Utah coal of over \$17 per ton.

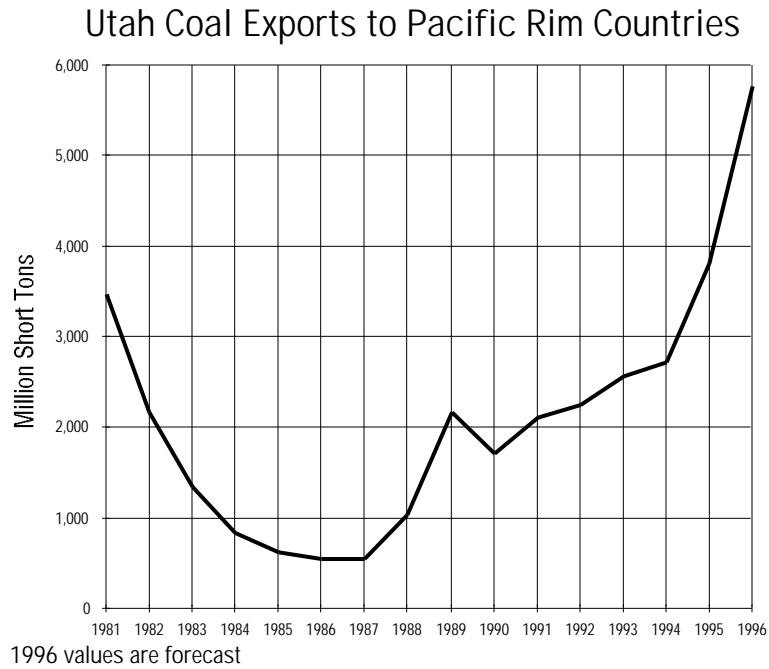
Utah coal exports are influenced by the world coal market. During the next ten years, steam coal demand is expected to rise in Europe as well as in the Pacific Rim. European coal imports should increase about 80 percent during this period due to greater consumption but, more importantly, to production curtailment in Europe.

Production in Europe will fall for several reasons. First, Europe has historically used lignite coal but has discontinued its use because of envi-

ronmental considerations. Second, many European coal mines are unprofitable but have continued to produce with government subsidies. Many of these subsidies no longer exist, making many of these mines practically unprofitable.

Geology is another important factor behind Europe's need to increase imports. In particular, deep underground seams are more difficult to mine. Production from some of these mines has now been halted as well. These curtailments will indirectly affect Utah's coal exports. As major Eastern exporting coal companies with subsidiaries in Utah start to ship more coal to Europe they may shift more of their Pacific Rim obligations to their Utah subsidiaries and affiliates. However, increased imports in the Asian coal market are basically consumption driven and will continue to be in the five percent range for the next 10 years. Notably, in this market, fuel oil competes very strongly with coal.

In 1996, Utah coal exports will surpass the five million ton mark. This level of coal exports was originally forecasted for the end of the decade, however, it may be reached far sooner than expected.



Activities of Utah Coal Operators

PacifiCorp

Energy West Mining Company, a subsidiary of PacifiCorp, mined a total of 7.5 million tons of coal in 1995. Of this total, 4.2 million tons were mined from the Deer Creek Mine and 3.3 million tons came from a combination of the Cottonwood Mine and the Trial Mountain Mine.

In the Deer Creek Mine, four longwall panels were mined on the east side of Third North. These were the fourth and seventh east longwall panels. Mining conditions in these sections were very good and the coal produced from these sections averaged less than nine percent ash. The continuous miner worked in developing the seventh through ninth west longwall panels on the west side of the Third North entries and in completing a portal break-out in Rilda Canyon.

The Rilda Canyon break-out was completed to provide an air intake to aid in ventilating the north end of the mine workings and to provide an emergency escape way. The facilities at the portals include a substation and a fan installation. The roadway in Rilda Canyon was also upgraded to provide better access to the portal area.

In the Cottonwood Mine, the second through fourth left longwall panels off Second North were mined. A rock parting is present within a por-

tion of this area and, as a result, the coal produced ranged in quantity from very low in ash (less than 10 percent) where the parting was not present, to a high ash content (near 20 percent) in areas of the rock parting. Coal from the low ash areas was shipped directly to the Hunter Power Plant; high ash coal was shipped to the preparation plant for washing. A fine coal circuit was added to the preparation plant in 1995.

Longwall mining in the Cottonwood Mine was completed in September and production was then moved to the Trail Mountain Mine. The Cottonwood Mine workings are being maintained and are being used to transport coal from the Trail Mountain Mine to the Cottonwood Truck load-out. Additional coal production is planned in the distant future for the Cottonwood Mine.

Longwall production in the Trail Mountain Mine began in October 1995 in the second left longwall panel off Fifth Left Mains. Mining in this area produced coal with an average ash content of 10.5 percent. Continuous miner development was completed in the Fifth Left Mains entries and in the first through third east longwall sections. The development in the Fifth Left Main section was in an area where rock parting was within the coal seam and high ash coal was produced which required washing prior to

shipment to the power plant.

Coastal States Energy Company

Early in 1996, following another very successful year by Coastal's Utah Coal mines, Coastal States Energy's parent surprised everyone by announcing their intention to seek qualified buyers for its coal business. The new owners will seemingly be ARCO of California and Itochu of Japan. In mid-October, The Coastal Corporation announced that it had reached an agreement with the two companies to sell its Utah Properties for \$615 million. ARCO (65 percent) and Itochu (35 percent) have indicated that a Limited Liability Company will be formed to operate Coastal's Utah properties. The Coastal Corporation has indicated that the proceeds from the sale will be used to improve its balance sheet by repaying high-cost debt and other similar obligations and to pursue other growth opportunities.

In 1995, Coastal's coal operations' operating results reflected the twelfth straight year of increased profitability. The 1995 operating profit was \$98.7 million compared with \$98.2 million in 1994. The eastern and western mines produced and sold 17.1 million tons of coal in 1995 including 9.8 million tons from Utah.

Coastal's Utah mines have benefitted from the increasingly stringent emission

requirements of the Clean Air Act Amendment and increasing export demand. Last year more than 1.5 million tons of coal from Coastal's three Utah mines moved to Midwestern U.S. utilities. Coastal's Utah low-sulphur coal has proven to provide a cost-efficient compliance option for these utilities. The Utah coal mines have also experienced growth in demand from the rapidly expanding utility steam coal requirements in Japan and a new market opportunity in South America.

The primary growth opportunity for Coastal is at its Soldier Creek operation. In 1996, Coastal plans to double its production at Soldier Creek to over one million tpy while improving productivity. Soldier Creek Coal Company also plans to begin development of its Dugout Canyon property, with its 60 million tons of reserves, in late 1996 or early 1997. As the market continues to expand, Coastal plans to increase production at Soldier Creek to more than 2.0 million tpy.

White Oak Mining and Construction Company, Inc.

In 1995, White Oak Mining produced 1.2 million tons of clean coal from its No.2 Mine. Most of this coal was shipped to eastern utilities with a minor amount shipped to the export market. Of note, the No. 1 Mine did not produce coal during 1995. Both the Upper and Lower O'Connor seams are being mined from the No. 2 Mine, since faulting makes access to

both seams possible. The No. 1 Mine did not produce coal during 1995, and it may not be necessary to reopen the No. 1 Mine to access resources in the Upper O'Connor seam. Employment for 1995 peaked at 145 and should stabilize at about 100 for 1996.

White Oak continues to evaluate southern areas of its leases for future production need; as well as the Miller/Gordon Creek leases adjacent to the rail load out. Environmental data collection and permit preparation continue.

Sunnyside Coal Co.

When the coal supply contract between Geneva Steel Mill and Sunnyside ended in February 1994, Sunnyside decided to discontinue operation and turn its attention to its reclamation work. This closure came shortly after Sunnyside celebrated its centennial.

Andalex Resources, Inc.

In 1996, Andalex installed a new radial stacker at the Wildcat load out. The capacity of the load out has been increased to 3.5 million tons per year. During most of 1996, Andalex has been producing coal at an average rate of 220,000 tons per month with 121 employees, including a few part time and student trainees. This rate of production adds to well above 10 tons per miner hour. This manpower planning is one of the reasons that during the first half of 1996 Andalex Resources was named as having the best safety record as

well as the highest productivity among the top twenty-five coal producers in the nation.

Andalex moved its longwall from Pinnacle Mine to Aberdeen Mine in 1995 and during 1996 moved the longwall once again in the Aberdeen Mine. The move took place in a little more than two weeks time. Andalex is now developing its Aberdeen Mine and producing vigorously from that mine. Both Pinnacle and Apex Mine are temporarily idle and all of Andalex's effort is concentrated on the Aberdeen Mine.

Andalex is one of the top Utah coal exporters and enjoys a very good relationship with the coal consumers in the Pacific Rim. Representatives of the Japan Coal Development Council visited the Aberdeen Mine in 1996. In all, coal exports in 1996 exceeded half a million tons.

Cyprus Plateau Coal Company

Mining in 1995 continued in western reserves located at the Starpoint No. 2 Mine at the three million ton per year rate. Advancing entries encountered significant faulting and igneous dikes as well as somewhat thicker than expected seam heights. Mid-year 1995 saw the final recovery of longwall panels to the south and startup of longwall activities to the north. Pillaring of South Mains was also started in 1995. Sales were principally to customers in Utah, Nevada and the Pacific Rim Nations.

The SMCRA Mine Plan Permit Application submitted in the first part of 1995 for the new Willow Creek Mine in Carbon County was approved in April of 1996. Through the concerted efforts of private, state and governmental individuals, evaluation and preliminary renovation of the existing coal preparation plant located in Price River Canyon started in 1995. Over a half million tons of coal waste were also moved from the proposed portal sites to a permanent refuse site.

A second year of extensive exploration drilling took place in the proposed Willow Creek Mine Project area. Four holes were completed in an adjacent open federal tract to gather data on seam continuity, quality, methane gas, and coal resources. The drill holes revealed significantly expanded in-place and recoverable reserves. An extensive rock mechanics program was undertaken to evaluate the mineability of the reserves and to assist in the design and layout of the proposed mine works. Reserves were calculated both for 15 and 30 year mine plans.

The year 1996 will witness the completion of two additional exploratory drill holes in the Open Federal Leases at Willow Creek to address correlation questions prior to mine startup. The open federal block should come up for bid in late 1996 and will be an important addition to the overall proposed mine plan.

Actual start up of mining

activities at the new Willow Creek Mine took place in the first part of September, 1996. Extensive construction of overland conveyers, prep plant rebuild, surface facilities, and dirt work were completed before this point. Portals were developed in the D Seam and entry Mains advanced down dip.

Reorientation of the main entries in the western part of the mine, due to revised structural projections, resulted in a slightly increased reserve base at the Starpoint No. 2 Mine.

Genwal Resources, Inc.

Genwal Resources enjoyed a banner year in 1996. Genwal produced over 2.5 million tons of compliance coal in 1996; Genwal's best year ever. Manpower has remained stable in 1996 and no increase is projected for 1997. Genwal is at its maximum production level with existing facilities. In 1997, significant capital will be spent on a new longwall and surface expansion projects. The surface expansion will allow for more efficient loading of trucks at the mine site significantly reducing the congestion in Crandall Canyon. Projected production will remain at 2.5 million tons for 1997 but will increase up to 3.5 million in 1998. Genwal anticipates adding significant reserves to their reserve base with the lease of UTU-71307. The lease sale is anticipated for mid 1997.

Co-op Coal Company

Co-op production in 1995 almost matched 1994 produc-

tion. The firm has been quite successful in sending various amounts of coal for test burn to the Eastern sector of the country. This could add to sizable out-of-state Utah coal sales in the near future.

Coal Leasing Activity in Utah

During 1995, there was only one federal coal lease sale in Utah. On May 22, 1992, Sage Point Coal Company, now owned by Coastal States Energy Company, filed an LBA (Lease By Application) for 2,098 acres in Alkali Creek Tract in Township 13S and Range 11E, sections 1, 11, 12, 13, 14, 15, 23 and 24. This new LBA can be used for continuous miner as well as longwall operation. The tract delineation for this lease was made in 1982 which covered all or parts of the above sections including section "10." The new tract delineation was subsequently made and now contains 2,177.32 acres holding 12.7 million tons of recoverable coal. This lease was opened to public auction in July 1995. Coastal bid the highest with \$2.667 million or \$1,225/acre, which amounted to 21¢ per recoverable ton. Three other leases have been applied for and the BLM is presently processing them.

On January 10, 1991, Coastal States Energy Company filed an LBA for 2,020 acres of federal land in Winter Quarters Canyon in the Wasatch Plateau coal field. The application covered sections 2, 3, 10 and 11 in Township 13 S and Range 6 E. The tract delineation has been made for 3,351 acres covering all or parts of sections 26, 34 and 35 of Township 12S and Range 6E and sections 2, 3, 10 and 11 of

Township 13S and Range 6E. An Environmental Assessment (EA) for the tract had been prepared by the U. S. Forest Service. The processing of this LBA, however, has been delayed for two reasons. First, BLM and Coastal had arrived at two different figures for the amount of recoverable coal existing in the delineated area. It is possible that the treatment in the vicinity of the faults gave rise to this discrepancy. The other problem dealt with the method of mining. Coastal employs longwall in all of its operations except for the mine development. The Forest Service prefers only fully supported mining operations under the perennial streams; however, longwall mining allows the mined panels to collapse and create a subsidence that may adversely affect the perennial streams. Some have suggested that the subsidence may create a fish habitat in the perennial stream by forming shallow ponds through which the stream may flow. The Forest Service, however, unwilling to take any chance on the perennial streams brushed aside such land management practices. After resolving these issues, a public auction was held on May 30, 1996 for the sale of 3,820 acres of the Winter Quarters Tract. Coastal's bid was the highest at \$6.5 million or \$1,701.63/acre, which amounted to 23.2¢ per ton. Coastal needs more reserves as it extends the Skyline Mine and adequate reserves are

essential for long term coal contracts. On the basis of their ongoing volume of sales coal operators in general attempt to keep a 30-year coal reserve on hand.

On March 3, 1991, Genwal Coal Company, which is now a 50/50 subsidiary of Intermountain Power Agency (IPA) and Andalex Resources, filed for an LBA covering an area of 1,974 acres overlapping some LBA lands previously applied for by Mining and Energy Resources, Inc. (MERI). Genwal now owns this tract. On February 4, 1993, Genwal Coal Company filed another LBA for 4,051 acres of federal coal leases covering all or parts of sections 1, 10, 11, 12, 13, 14 and 15 of Township 16S and Range 6E and sections 6, 7 and 8 of Township 16S and Range 7E on land adjoining its presently operating mine and the LBA which was previously applied for. This LBA is in the process of delineation and will go out for bid in 1997.

PacifiCorp Electric Operations (Utah Power) of Salt Lake City submitted an LBA on February 26, 1991, for 7,864 acres in the North Trail Mountain/Cottonwood Creek area of the Wasatch Plateau coal field in Emery County covering all or parts of sections 2, 3, 4, 9, 10, 11, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32 and 33 of Township 17S and Range 6E. This application is in full con-

formity with responsible and prudent coal operation. The BLM currently is processing this application and a draft delineation has already been prepared. However, expectations of this federal coal lease being offered for competitive bid in 1996 may be on the optimistic side.

On August 16, 1995, Horizon Coal Corporation of Wise, Virginia applied for an LBA covering an area of 1,280 acres in Township 13S and Range 8E.

Outlook for Utah's Coal Industry

Forecast for 1996

Prices

Over the past decade, coal prices in Utah have been on the decline. In 1984, Utah coal, on average, sold for \$29.20 per ton. During 1995, the same coal sold for \$19.11 per ton. This represents a decrease of 35.5 percent in current dollars, but a decrease of almost 56 percent on a constant dollar basis.

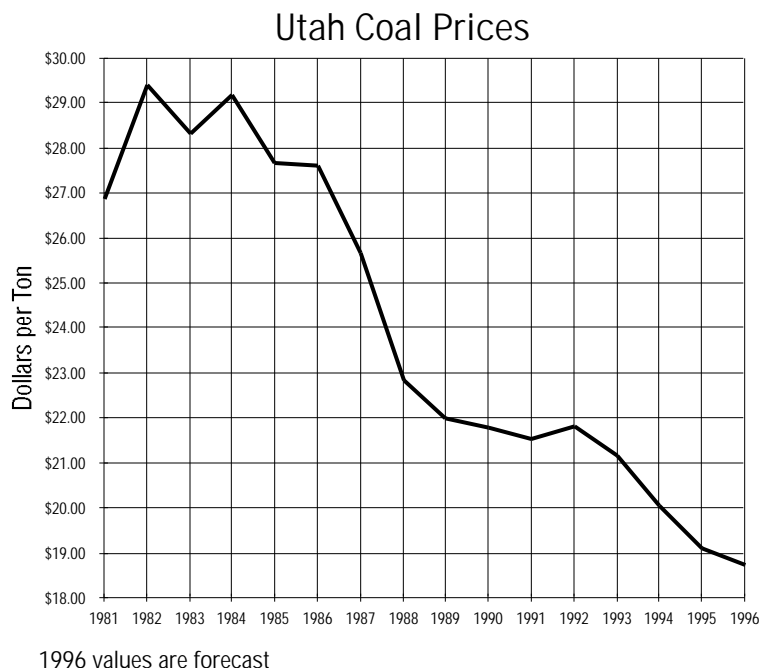
From 1990 to 1993, the average prices have fluctuated around \$21 per ton and hit a new low of \$20.07 in 1994. In 1995, another new low was established at \$19.11. Even though this appears to be a decline in coal prices - in reality - it is not. The increase in sales occurred mostly in the export market and new contracts with the eastern utility market which were at the lower end of price scale while the reduction of delivery for example to IPP (about 0.7 million tons) occurred in markets which were at the upper end of the price scale. This, therefore, indicates a possible "bottoming out." In the near term, the average price will most likely remain stable; for 1996, the average price of coal will probably be about \$18.75 per ton. The current dollar prices will start moving up after 1996; however, the price of coal as measured in constant dollars is expected to continue to fall slightly. In other words, even though the average dollar price per ton will accelerate, the rate of increase should not

exceed the rate of inflation.

It is important to bear in mind that Utah's coal prices are influenced by the world price of coal. The correlation may not be high, but the existence of strong influence cannot be denied. Currently, world coal prices are increasing. Coal operators in Utah recently agreed to a two dollar per ton increase in coal prices exported to the Pacific Rim

it does affect the spot market and to some extent affects the average coal price.

Other factors, however, tend to bring coal prices down. Technological developments in coal production and handling continue to lower the break-even point for coal production and to reduce coal prices overall. Large volume production allows operators to reduce profit margin per ton



countries of Taiwan, Korea and Japan. Other countries such as Australia and South Africa have negotiated a much larger price increase, some as much as \$6.00 per tonne. Even though export prices for Utah producers are not a determining factor in overall coal prices, and the sale takes place on marginal production,

by lowering prices and still keep overall profit high. The abundance of coal supply on the international market will continue to exert pressure on Utah coal producers to keep prices competitive.

World recoverable coal reserves stand at 1.141 trillion tons. World coal production and consumption is around

five billion tons per year implying that, at the present rate of consumption, the world has an adequate supply of coal for the next 227 years. This, of course, is based on the recoverable reserves that are known and reported at this time. There are many coal reserves that remain undiscovered and some that are discovered but not reported. There is also some question about the "recoverable" fraction of the recoverable reserves. By "recoverable" we refer to resources that we can mine efficiently with today's technology. However, future technology may yield more recoverable resources; hence a much greater recoverable reserve.

The rate of consumption also directly affects the remaining number of years of supply. As the world's population increases, the demand for energy, including coal, will increase. As developing countries, with high growth rates, expand and add energy-intensive industries, the demand for energy and coal will increase in tandem. Presumably, at the same time, new technologies will help us achieve much greater efficiency in our energy conversion. Today, on average, we burn 10,080 Btu (0.84 lb. of 12,000 Btu per pound of coal) to generate one kwh of electricity which has 3,413 Btu. In other words, in the process of conversion we lose 6,667 Btu or 66.1 percent and end up with 33.9 percent of the energy used. By the turn of the century, many of our energy conversion units

will have a heat rate of 6,800 Btu/Kwh or slightly more than 50 percent. This, in reality, means that by the turn of the century we should be able to use the same amount of coal to generate 50 percent more electricity than we do today, implying that our reserve-to-production ratio will increase; therefore, we will extend the life of our reserves. This leads to the conclusion that the world has a vast coal reserve and this supply overhang will ultimately keep the supply up and the price down.

In the face of declining coal prices, there are those companies with strong management, employing newer technology and innovative processes, that have managed to post sizable profits in 1995, and may register even higher profits in 1996.

Production

Utah coal production for 1996 will surpass 27 million tons, reaching an all-time high in the industry's 127-year history. Steam coal use by the electric utilities in the East as well as greater level of exports will account for this record.

Electric utilities in the East will continue using greater amounts of Utah coal in the years to come. In addition, Pacific Rim consumption will increase after the completion of the \$180 million expansion of the Port of Los Angeles Dry Bulk Terminal. Construction has already begun. In June of 1995, the Phase II design and engineering contract was awarded to Jacobs Engineering Group,

Inc. of Pasadena. Coal will be unloaded from unit trains by tandem railcar dumper and stockpiled by overhead traveling stacker. Pile activators and belt conveyors will then reclaim the coal and convey it over land to the ocean-going vessels. This project, which initially would handle seven to eight million tons of coal per year, is expected to be completed and operational by 1997. The success of this terminal is guaranteed in light of the diversity of shareholders representing every facet of the coal market including coal producers, transporters and consumers. Because of the Pacific Rim expansion, industry analysts believe consumption will increase to more than seven million tons by the end of the decade.

Distribution

During 1996, distribution of Utah coal most probably will top 28 million tons while production will top 27 million tons. Distribution of electric utility coal to out-of-state customers will increase by as much as 1.1 million tons increasing from 6.6 to 7.7 million tons. In 1996, we are expecting an increase of 35 percent in consumption by states other than Utah, California and Nevada.

In 1984, the Federal Energy Regulatory Commission (FERC) ordered American Electric Power (AEP), the parent company of Indiana Michigan Power Company, to limit the cost of delivered coal to its Indiana plants. As a result, AEP decid-

ed to close its wholly owned subsidiary, the Price River Coal Company in Helper, Utah because the delivered cost of coal to the Indiana utility plant exceeded \$48 per ton. Eleven years and 33.7 percent inflation later, Utah coal is flowing eastward for just over \$30 per ton delivered.

Most analysts presumed that eastern utilities would not purchase Utah coal until the second phase of the Clean Air Act Amendments of 1990 (CAAA). However, price advantages have since attracted these utilities to our resources.

The first and most important reason behind increased interest in Utah coal is the decrease in cost of coal production. In 1984, the average price of Utah coal stood at \$29.20 per ton. This average price was the combination of term price that was usually three to five dollars per ton more than the average price and the spot price that was five to eight dollars per ton less than the average price. This put the average price of term coal at \$32.20 per ton. Last year, two Utah coal operators signed coal contracts with the Tennessee Valley Authority (TVA) -- one of them for less than half the price of ten years ago. The importance of this cost reduction, however, should be weighed in light of the fact that more than 33 percent inflation has accrued over the past eleven years.

The second factor is the merger of the Denver and Rio

Grande Western (D&RGW) railroad with the Southern Pacific (SP) railroad in 1989. This merger created a direct line from the coal fields of Utah which were on D&RGW's route to the out-reaches of SP in the east.

The third factor that may be just as important as the first is Geneva Works' decision to bring in taconite from Minnesota, thus creating a significant backhaul opportunity for Utah coal to go eastward. Geneva Steel originally used the iron ore from mines near Cedar City, Utah. Part of the iron ore still comes from two mines near Cedar City, namely the Comstock and the Mountain Lion which Geneva owns. Though Geneva considered the 54 percent grade of iron ore satisfactory, some criticized the negative chemical and physical properties associated with this ore that required costly mixing with other ores.

Geneva Steel started buying taconite in 1962 from the Atlantic City Mine in Lander, Wyoming. This operation continued until 1983 when Geneva switched to Minnesota taconite. Minnesota operators also pelletized and concentrated the taconite to 64 percent iron instead of the usual 27 percent. Union Pacific (UP) railroad held the original transportation contract which annually brought in 2.4 million tons of taconite from Minnesota to Orem, Utah and then went to Wyoming to pick up Wyoming coal for eastern

utilities. UP's contract ran out at the end of August 1994. At the beginning of 1994, Southern Pacific restructured a new transportation contract. The first leg of this package consists of bringing in taconite from Minnesota to Orem. Taconite originates from the U.S.S. Minntac Mine located between Virginia City and Hibbing, Minnesota. DM&IR (Duluth, Misabe and Iron Range) takes it over 60 miles to the Duluth and Steelton switchyard in Wisconsin. From there, Wisconsin Central takes it over a distance of 473 miles to Chicago where SP moves it to Orem, Utah through Kansas City, Pueblo and Grand Junction, a distance of 1,672 miles for much less than \$20 per ton. The second leg of this package consists of shipping Utah and Colorado coal to utilities in the east. SP began contacting Utah and Colorado coal producers to ship coal to seven electric utilities in the East. Most of the coal will go from Price, Utah or Grand Junction, Colorado. The backhaul price - amounting to less than the value of the coal - to St. Louis was held constant for both Utah and Colorado coal producers. SP contacted Wisconsin Electric Power (Genwal is now selling to them through Koch Carbon), Illinois Power (Coastal is now selling to them), Detroit Edison and other electric utilities and major industrial coal consumers. SP's main interest is to have the backhaul going either to Chicago or to St. Louis in order for the coal to be put on the Mississippi

River to be barged south or eastward to nearby utilities. To accomplish this, SP allocated 1,400 steel cars carrying one hundred tons each for a turn-around time of seven days each way or a complete turn-around time of 14 days. This would enable SP to send 3,640,000 tons of taconite to Orem, Utah and carry back the same amount of coal to the Chicago/St. Louis area.

The fourth factor was nature. SP had contacted TVA as early as 1992 to create a possible interest in western coal, but TVA was not interested until the flood of 1993. This flood curtailed shipment of eastern coal to the TVA electric utility plants. As a result, TVA decided to take a second look into the more secure coal supplies in the West.

The fifth factor creating this environment was the passage of the Clean Air Act Amendments of 1990 whereby electric utilities were given SO₂ emissions credit for emitting less SO₂ than the allowable level, which would be saleable to other high emission coal consumers. TVA, by consuming Utah coal, could actually generate emissions credits which it could then sell to offset the slightly higher delivered cost of Utah coal to its Allen Plant near Memphis, Tennessee.

The sixth and the final factor was the TVA itself. TVA is a very large electric utility organization with 44 plants in the south, central and south Atlantic region; 29 plants in

Tennessee; six in Alabama; two in Georgia; three in Kentucky; and four in North Carolina. Two of these plants, one in Alabama and one in Tennessee, with total generating capacity of 5,896 MW are nuclear. Ten plants with total generating capacity of 18,130 MW use bituminous coal and the remaining 32 are hydroelectric. The ten plants using bituminous coal could consume as much as 50 million tons of coal per year. In 1993, TVA plants burned 37 million tons and by 1999 may burn up to 42 million tons. TVA is essentially creating a monopsony within its own region and to some extent can dictate the regional price of coal as well as the transportation cost. This, in addition to backhauling, is exactly why TVA has been able to negotiate a low freight rate for the haulage of 3.75 million tons per year of coal from Utah and Colorado. TVA coal purchases from Utah and Colorado could soon top five million tons per year in addition to the purchases from other utilities in the East.

To keep its cost down and handle this large volume of coal transportation, SP has ordered 920 aluminum cars with 117 tons of carrying capacity. This allows SP to save 17 percent on its cost and offer an attractive rail rate to its electric utility coal customers.

On January 1, 1995, TVA and White Oak Mining and Construction Company, Inc. signed a ten year contract for annual delivery of 1.5 million

tons-of-coal-per-year. Another coal contract for delivery of one half million tons-of-coal-per-year for the duration of ten years was signed on the same date between TVA and Genwal Coal Company. This was the first time in ten years that Utah coal had started to flow to electric utilities in the East on a long term basis even though numerous spot sales had been made to that sector of the country.

This two million tons of additional coal through 2005 was a great boost to Utah's coal production. It will lead to more jobs in Utah's coal industry as well as many indirect jobs in local communities.

Distribution of Utah coal to electric utilities within the state should show very little year-to-year change, unless new facilities are built or some of the older units are retired. Older units experience more down-time due to maintenance and repair, so a slight decrease in distribution is expected. The only unit that could affect the electric utility coal consumption within the state is the Intermountain Power Agency's IPP plant. During years with higher precipitation in the Pacific Northwest, more hydropower becomes available at costs below those of coal. This will, to some extent, curtail the operation of IPP units resulting in less consumption of Utah coal. For 1996, this unit will purchase and burn almost half a million tons more than it did in 1995. PacifiCorp distribution will also be increased

by another 0.8 million tons while the consumption of coal and generation of electricity at the plants increases.

Consumption of Utah coking coal will cease to exist in 1995. It is doubtful that any more coking coal will come from Utah under present circumstances. Distribution of Utah industrial coal within and outside the state during 1996 will increase by 77,000 tons, increasing only slightly in the future as out-of-state consumption increases.

Distribution to the residential and commercial sector will decrease during 1996. The decrease, however, is ultimately tied to the price of natural gas. Some commercial operations may begin switching from natural gas to coal which should result in increased consumption.

Finally, in the export market during 1996, distribution will increase by more than 50 percent, or almost two million tons.

The general outlook for Utah's coal industry is bright despite some coal operators having moved their operations to other states, sold, or otherwise disposed of their Utah coal properties. Still we have seen a number of companies expand operation and double in size within the past three or four years. We have also seen many companies apply for new federal coal leases, indicating continuing interest in Utah's coal reserves. Finally, a new mine is opening in 1996, an activity that bodes well for

the future of Utah coal.

Coal production in Utah has enjoyed steady growth since the mid-1980s and has doubled in size within the short span of a decade. Despite coal prices that have declined steadily for a decade, coal production in Utah has doubled. This is indicative of a strong and healthy coal industry.

In 1996, we expect electric utility coal consumption outside of Utah to increase by at least 1.11 million tons over the previous year. This large increase will be more permanent than the spot sale of previous years, for most of the increase will be the result of long term contracts.

Federal, Legislative and other Issues

- Utah coal miners are by far the most productive underground miners in the nation: even more productive than nearly half of the country's surface coal miners. As the coal miners' productivity improves, the wage portion of the mine mouth price decreases. At present, Utah coal miners are producing coal at the rate of almost seven tons per hour which is about three and a half times as much as in 1981 when they produced approximately two tons per hour. At that time, the wage portion of the cost of coal production was above 25 percent; today this has decreased to about 15 percent. These gains are not permanent however; as the price of coal goes up and the effect of the increased pro-

ductivity on the wage portion of the value of coal gets defrayed by the increase in wages, there still will be a tendency for this ratio to decrease; but as the rate of increase in productivity decreases the curve of the ratio of wage to coal approaches a limiting value and other factors such as the transportation cost of coal will play a more predominant role in the final terms of coal contracts than the coal miner's wages.

- Union Pacific (UP) and Southern Pacific (SP) announced plans to merge their operations. The merger, when it finally takes place, will create an expansive network of transportation facilities that could possibly facilitate the shipment of coal over greater distances. This would be fortuitous for Utah coal operators, but at the same time, the very competitive transportation market would fall under what is understood to be a monopoly. The unification of very competitive units could give rise to apprehension on the part of the shippers. While the access to capital for upgrading the lines and streamlining the operation might be more readily available, the cost of operation could increase causing economic hardship.

Transportation for Powder River Basin coal which reaches throughout the Midwest and South Central is very competitive and puts downward pressure on costs. If competition disappears we

might experience an increase in price, but only to the extent that would ensure the same volume of coal shipment. This could also be the same after the UP and SP merger for Utah coal. It is this possible increase in shipping cost that could eventually prove to be deleterious to Utah coal production.

- On the other hand there is, of course, the possibility of a greater streamlining of the coal transportation system after the merger of UP and SP which could possibly result in slightly lower rates for the new eastward bound Utah coal. This in conjunction with greater miner productivity should keep the price of Utah coal very competitive and could lead to more sales to the Midwest. There is every confidence that the management of the new company will be cognizant of the fact that a lower transportation cost could lead to much greater transportation volume. We must, however, not lose sight of the fact that the transportation cost is heavily influenced by the price of oil. Should oil prices happen to go up for reasons unforeseen, due to political and economic environment changes, the transportation cost for long distance shipment would adversely be affected and Utah coal producers might experience a decrease in sales to the Midwest. Considering the low probability of such a development it would be safe to predict that the effect of the decrease in the wage portion of the value of coal and the

streamlining of the transportation system would bode well for Utah's coal industry.

Appendix

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History of Coal Mining in Utah

If we were to pick one energy resource that has had the greatest effect on the life of Utahns and the development of the state of Utah, it would be coal. Indeed, the history of coal in Utah is the history of Utah: The two are inseparable. No sooner than the early settlers arrived in the Salt Lake Valley, that the search for coal was underway.

There were two fundamental reasons behind this urgent search. The first was a need to secure a viable source of fuel for heating. It was soon realized that the available timber was too difficult to harvest and costly to remove from the depths of the canyons. Furthermore, the timber harvested was deemed best suited for the construction of homes rather than used as a fuel. The second was the need to create a steel-based industry whose manufactured goods were the prerequisite of a modern industrial economy. To this end, smelting processes were required. Coal would soon prove to be the obvious fuel of choice.

The early settlers were availed of a strong leadership, numerous artisans, and skilled workers, as well as men of craft and artistic ability. However, they also lacked the financial resources to purchase their requirement and transport manufactured goods from areas east of the Mississippi. There was another consideration that gave impetus to coal mining: a

desire to develop the precious metal deposits of the state, though this goal was of less importance than the critical reasons stated above.

It was at this time that the building of the railroad gave an added boost to the coal industry and made coal more readily available and at lower cost than before. Whether it was the blossoming of the coal industry that brought the railroad to central Utah or whether it was

the coming of the railroad that made the coal industry, one cannot readily say; to be sure this chicken vs. egg dilemma cannot be addressed at length in this short recitation.

I. The Period of Discovery: 1849 - 1878

In the winter of 1849, just two and a half years after arriving in Utah, a Mormon expedition under the leadership of Parley P. Pratt found deposits of coal in the Kolob coal field in Iron County. Coal was also discovered the following year in Wales, in Sanpete County, by two former Welsh coal miners who also founded the town in 1857, and soon after other miners discovered coal resources in the Coalville coal field, in Summit County.

Coal was first produced from the Kolob field in 1852 (some records show 1851) less than five years after settlers arrived in Utah; and from the

Wales coal field in 1855 (some consider this to be actually the first coal production), and from Coalville coal field in 1859. Since the Kolob and Wales coal fields were far away from Salt Lake City and the coal which was coked was only good enough for lead but not for iron smelting, more expenditure of effort was concentrated on Coalville, which was only 40 miles from Salt Lake City. This field was producing 50,000 tpy by 1880 and by its last closure it produced 4.3 million tons.

Even though the Coalville coal field was active through the 1870s, the reasonably priced and better quality Rock Springs coal, produced by Union Pacific (UP) owned mines, reached Salt Lake City at a lower price than Coalville coal. It was during this decade that UP coal was completely unrivaled.

In late 1874 by some accounts, or early 1875 by others, coal was discovered around Scofield (Pleasant Valley) in what is known today as the Wasatch Plateau coal field. In the ensuing five years numerous mines opened up in the area with some having lasted for more than 50 years, others just a few years. Notable among these were:

Fairview Coal and Coke Company which opened a mine in Huntington Canyon and built a settlement called Connelsville in 1875. One year after coal was discovered

in Carbon County, coal was coked locally and sent to Springville by wagon, but this proved to be too costly and after a few years of operation the mine and the settlement were abandoned.

Winter Quarters, on the other hand, was more of a success story. Milan O. Packard and Myron Crandall, owners of the newly acquired coal claim, had the coal extracted and transported by wagon to Springville. Pleasant Valley Coal company was incorporated the following year and the Pleasant Valley Railroad Company started to build a line from the mine to Springville in 1877. Rio Grand Western Railroad purchased the mine and the railroad in 1882. When this mine was closed in mid-1940 it had completed more than 65 years of successful operation and had produced 10.8 million tons of coal.

Utah Central Coal Company was started by Mr. Hatch of Springville in 1876 and purchased by Mr. Pugsley of Salt Lake in the following year. On the first day of 1884 the first Utah coal fatality occurred in that Mine. In 1890, Union Pacific Coal Company purchased this coal property which sold it to Scofield Coal Company in 1917. This mine did not produce coal after 1936. Altogether this mine operated for sixty years and produced just under 2.0 million tons of coal.

From 1851 to 1878 Utah had gone through the age of

discovery. Many coal fields were located both close to and far from population centers, some too far to be economically viable, and some were not too close but close enough that an adequate transportation system made them economically feasible to mine.

A successful coal mining operation has always required five factors: a good quality coal, the ease of mining, a skilled labor force, capital expenditure, and an adequate transportation facility. Transportation has played a particularly important role in the success of a coal mining operation. It was also the interrelationship between the transportation companies that gave rise to central Utah's coal field success.

II. Period of Infrastructure Building: 1879 - 1899

During this period, Utah's coal industry went through a period of infrastructure building. Many mines were opened, the railroad system to get the coal to the market was expanded, and a strong labor force was assembled.

The preeminence of Carbon County in Utah's coal production was inextricably tied to the competitive forces in transportation. Denver and Rio Grande Western (D&RGW), which recently merged with Southern Pacific (SP), in a move to seize the coal production and transportation from Union Pacific (UP), (which a few months ago merged with SP), purchased Pleasant Valley Coal

Mines and Railroad and became a major force in the life and livelihood of Carbon County residents.

Utah Fuel, a subsidiary of D&RGW, acquired Winter Quarters Mine in 1882, Castle Gate in 1888, and Sunnyside Coal Properties in 1890. Winter Quarters had its good and bad moments. On May 1, 1900 an explosion occurred in the No. 4 Mine killing two hundred miners. In that same year when Utah coal production surpassed the one million ton mark, more than 900,000 tons of the amount was produced by Utah Fuel Company. The mine, however, operated successfully until the depression of the 1920s; it finally closed in mid-1940.

During the expansion of D&RGW through Carbon County, a coal seam was discovered north of Helper which was deemed adequate for steam locomotives at the time. D&RGW built the facility, north of Helper, to mine this coal. The first groups of miners were brought in from the Winter Quarters Mine of Utah Fuel Coal Company. Later, Italians and Greeks were hired to work in the mine. On March 8, 1924, a gas explosion at the mine killed 172 miners, 62 of whom were Greek.

By 1974, McCullough Oil Company had bought Castle Gate, Kenilworth, Clear Creek, Spring Canyon and Hardscrabble coal properties. McCullough dismantled the town of Castle Gate in order to use the site for a prepara-

tion plant and loadout.

In 1890, Pleasant Valley Coal Company, which had acquired the Castle Gate property in 1882 and started producing coal in 1888, erected 80 eight-foot beehive ovens at the Castle Gate site; by 1900 an additional 124 ovens had been built. Pleasant Valley also acquired Sunnyside mines in 1890. After the Sunnyside mines became fully operational in 1898, it was determined that this coal was more suitable for coking than Castle Gates' coal. For the first five years, Sunnyside Coal was hauled to Castle Gate for coking but after 1903 Pleasant Valley started building coking ovens at Sunnyside. By 1919, the Sunnyside coke plant was the largest single beehive in operation in the country with 819, 12- to 13-foot ovens. Sunnyside Mine did not become fully operational until 1898; however, the mine was starting to produce coal before that time and, prior to its closure in 1994, it had celebrated its Centennial.

Pleasant Valley Coal Company also found coal in a little logging camp six miles south of Scofield just before the turn of the century in what is known today as Clear Creek. The town grew rapidly. Coal production reached its peak in the second decade of the Century with the hard work of mostly Finish miners who had recently immigrated to this county. The town reached a maximum population of 600 before declining.

The coal became too deep by late thirties and most of the miners moved out. Currently there are still people living in this town for part of the year.

III. Period of Rapid Growth: 1900 - 1921

Coal production in Utah was first recorded in 1870. In that year, the state produced 5,800 tons of coal. During the period of discovery from 1851 to 1978, the production started to increase and, by the end of this period, we produced an average of 50,000 tons per year (tpy). In 1899, with the infrastructure in place, Utah produced 878,000 tpy. From 1900 to 1921, Utah's coal industry went through a period of rapid growth. Production at the end of this period increased nearly 700 percent as compared to the production at the end of the previous period.

At the turn of the century, more mines opened. In 1904 we had 155 coal mines in Utah requiring more miners. Though there were many mines operating in Utah they were mostly wagon wall mines. Most of the coal during this period was produced by six mines: Sunnyside, Clear Creek, Winter Quarters, and Castle Gate of Utah Fuel Company, each producing more than one-quarter of a million tpy; Kenilworth of Independent Coal and Coke and, finally, Scofield Mine (Pleasant Valley Mine) of UP Coal Company also produced about one-quarter of a million tpy. By the middle of this period more than half of the min-

ers were immigrants from Japan and many European countries such as Greece, Germany, Finland, Austria, France, Italy, Ireland, Sweden and England. The conditions were harsh and the work was hard, but the hard work paid off in the long run and they found a decent quality of life in the coal fields of Utah. Soon it was realized that the Eastern Book Cliffs' coal had a good coking quality. By 1917 more than one million tons of coking coal was produced from this field. This period is also marked by improved mechanization and a better transportation system. By the end of this period, Utah's coal industry and Utah's coal resources were held in high esteem.

In "Mineral Industry of Utah" (1919), the author described the coal resources of Utah as enormous and states that "the amount of coal in the state would suffice to supply the coal requirements of the entire world for nearly one hundred years. Of course 11 years later this claim had been reduced to: "the total reserves would supply the entire United States at the present rate of consumption for 100 years."

Spring Canyon Coal Company, located west of Helper in Sowbelly Gulch, had its beginning in 1895 when Teancum Pratt started taking coal from the outcrop for personal use. By 1911, Union Coal Company started exploring the possibility of mining the coal. The mineral

rights of the Spring Canyon were purchased by Jesse Knight who started to build the town and produced from the mine in 1913. Just after World War II, the town had a population of one thousand, which was a relatively good size town for Utah. However, by 1970, the mine closed and the town was abandoned. By 1975, the town all but disappeared.

Another mining town that survived was Kenilworth, situated less than five miles east of Helper. Heber Stowell found coal cropings in this area in 1904 and formed the Independent Coal and Coke Company (IC&C) in 1906 to mine the coal. The town of Kenilworth was subsequently built high on the hill. Except for the tramway that rises above the town, no trace of mining operations is visible in this otherwise beautiful setting. The mine operation was also quite successful and mining was continued until recently.

During the period of rapid growth which began before World War I many independent coal operators, including Charles Strevell of Independent Coal and Coke Company, Jesse Knight of Spring Canyon Coal Company and the brothers Fred and Arthur Sweet of Standard Coal Company, wanted to expand their production and marketing activities; but their desires were to some extent stifled by D&RGW as they were not availed of competitive transportation rates. Their

ordeal finally led to the creation of the Utah Public Utilities Commission which regulates railroad rates. To some extent this demonstrated the power of the transportation industry to manipulate the marketing activities of rival coal operators.

Panther Coal Company gave its name to a small town that was settled in 1911 roughly two miles northeast of Helper. The name was later changed to Carbon. Just before the start of World War I, production of coal started from the mine. During the same year U.S. Fuel Company purchased this company and renamed the town Heiner. Before the Great Depression, the company town population grew to 600 and was later abandoned in the 1930s. Today, there is almost nothing left of the town.

In June of 1912, United States Fuel Company, a subsidiary of Sharon Steel of Miami, Florida, purchased the last of the company-built towns including: Hiawatha, Moahland and Black Hawk properties. U.S. Fuel also acquired the Consolidated Fuel Company, Castle Gate Coal Company, Black Hawk Coal Company and the Panther Coal Company.

Concurrently the Utah Railway, another subsidiary of Sharon Steel, was organized to connect the King mines of U.S. Fuel to the town of Helper. It was during the second part of this period that Utah coal played an important part in the successful continu-

ation of the opening of the west by fueling the trains and sending coal to the west for industrial and transportation consumption.

IV. Period of Stagnation: 1922 - 1940

In these two decades, Utah experienced a period of stagnation and decline. During the first decade of this period coal production hovered around 4.5 million tpy peaking at just above five million tpy in 1929 and pulling back to an average of 3.3 million tpy through the next decade.

During this period, while Utah mines were to some extent disadvantaged due to transportation constraints, they competed successfully in spite of The Depression-induced shrinking coal market. Opening of the Columbia Steel's Ironton Plant near Provo also gave an added boost to an otherwise contracting industry. Columbia Steel used the Book Cliffs coal in its plant to make coke which was much more efficient than the traditional beehive coke ovens. Mechanization was changing this labor intensive industry. In the absence of a robust market most organizations constrict their capital expenditures, but some Utah coal operators decided otherwise. They streamlined their operations and continued with their mechanization such that they became very competitive in a declining market. It was during this stagnation period (in 1925) that the first coal-fired electric utility plant, the 20 MW Jordan Plant in Salt

Lake city went into operation, which gave a small boost to Utah coal production. It was also during this period (1938) that Carson W. Smith, President of the Consolidated Coal & Coke Company of Denver, approached Harold Silver, a native of Utah who had recently moved to Colorado and, at the Denver Athletic Club, asked him if he could design a machine that would solve the coal mining problems of the day.

By 1940, Consolidated Coal & Coke Company and Silver Engineering entered into a contract to design and build a machine that would take the place of the machines used to undercut, drill, blast and load coal. The construction of the first experimental continuous miner was completed in 1943 and the first continuous miner entered commercial operation in 1946. During 1947, Joy Manufacturing Company of Pittsburgh, Pennsylvania, bought Silver's invention and agreed to pay him royalties. This machine was listed in Time Incorporated's book *Machines* in 1964 and cited as the 150th major invention in the history of the world. The Kaiser Coal Company purchased the first two continuous miners in Utah in 1951 for its Sunnyside operation. Kaiser demonstrated its leadership in 1961 again by purchasing one of the first two longwall machines that was used in the country.

The first stagnation period in coal production (from 1921

to 1940) coincided with other energy sources becoming more cost-effective and abundant. We used coal to heat our homes, churches and stores. In the mid-twenties this use was beginning to be replaced first by fuel oil and later in the 1930s by natural gas. The Great Depression of the 1930s resulted in a slowing down of the consumption of coal, but it also helped the consumption of coal by making the changeover cost to other energy sources less affordable. Many homeowners could simply not afford the cost of changing to fuel oil.

We used coal for transportation in our steam locomotives, but this was also displaced by diesel fuel, even though Rudolf Diesel himself had envisioned using some sort of coal slurry in his invention. From the beginning of the 1930s, we replaced our coal-fired steam locomotives with diesel engines and every year we used less coal for transportation and freight. The industrial energy users also started to turn their backs on coal, preferring natural gas for its ease of handling and cleanliness.

This period saw more mines close than open, but nonetheless there were mines being opened.

During the fall of 1920, Amalgamated Mines Company of Denver, incorporated a subsidiary by the name of Blue Seal Coal Company. The mine, which was located about a mile north of Scofield, was opened in the Spring of

1921 and worked intermitantly through the mid forties.

Both Gordon Creek Coal Company and National Coal Company started mining coal in upper Gordon Creek area in 1921. The mines operated through the thirties and reopened during World War II.

Mutual Coal Company located at the west end of the Spring Canyon was incorporated and started working in 1920. It worked successfully for about 18 years until it closed in 1938.

During 1922, Columbia Steel Corporation opened up Columbia Mine in eastern Book Cliffs to provide coking coal for its Ironton Steel Plant in Provo. This mine operated successfully until 1967 when it closed down.

During 1926, Mike Francis incorporated the Maple Creek Mine located in the south east of Standardville and started the construction of the tippel and the excavation of the tunnel. By February 1928, Maple Creek Mine was in operation and worked successfully if profitably until 1937 despite a damaging fire in 1931.

V. Period of Rejuvenation: 1941 - 1957

The vibrant and rapid growing coal industry in Utah that had fallen prey to the vagaries of the Depression was saved primarily by the steel industry and secondly by production for World War II. In addition to Ironton Plant of Columbia Steel, which pro-

duced about one million ton of coal for coking per year, Kaiser Steel spent substantial amounts of money to develop the Sunnyside Mine to supply the coking coal requirement of its Fontana Steel Plant in California. Geneva Steel Company of Orem, which was later sold to U.S. Steel (1946), opened Geneva Mine in the eastern Book Cliffs coal field.

From the mid-forties to the mid-fifties there were two forces working in opposite directions that affect Utah's coal production. The steel industry was going ahead in full force consuming an average of 2.5 million tpy or more than forty percent of total production. Also, from 1950 to 1957 three electric generation plants of Utah Power and Light (Hale II, 1950, Gadsby I, II and III, from 1951 to 1955 and Carbon I and II in 1954 and 1957) came on line. These units were using about 1.25 million tpy of coal or more than twenty percent of the average production at the time.

On the other hand, all residential customers within the periphery of the larger towns and cities that could not afford the changeover to fuel oil or natural gas during the Depression and the early 1940s could now afford to do so -- and they did. A very lucrative sector of the coal industry all but vanished within a relatively short span of a few years.

In the transportation sector the increase in the number of

locomotives that were temporarily halted due to forcible participation in World War II, resumed again, but the fuel of choice was no longer coal.

VI. Period of Decline: 1957 - 1972

From 1957 to 1972, a total of 15 years, Utah's coal production went into a decline. Steel production was shifting from the United States to Japan and later to Korea. As a result, there was lower demand for Utah's metallurgical coal. Nearly all of the residential and commercial heating had changed over to fuel oil or natural gas and there was no longer demand for coal in the transportation sector. The Huntington and Hunter Plants of UP&L were yet to be built. The Naughton Plant which was built in Wyoming did not use Utah coal. In other words, there were no additions to capital stock that consumed coal -- only deletions.

In this period of decline, however, there were indications of good things to come. The world's proven oil reserves did not indicate a sustainable future during the boom years following World War II. In many credible publications, 20 to 25 years were given as the length of time that the known crude oil reserves would last. Oil executives started to look at other energy resources and coal appeared to be the most viable. Within a few years companies such as Exxon, Gulf Oil, Standard Oil of Ohio, Texaco, Atlantic Richfield, Phillips Petroleum,

Continental Oil, Occidental Petroleum, Kerr-McGee, Humble Oil, Getty Oil, McCullough Oil, Ashland Oil, Quaker Oil and Coastal Energy, became the owners of various coal properties, some also in Utah. It was in the midst of this coal property acquisition that the quadrupling of the oil prices was forced upon us by the Organization of Petroleum Exporting Countries (OPEC) in 1973 which gave rise to the idea of using coal for the generation of electricity in place of fuel oil or natural gas. This marked the end of the decline in Utah's coal market as we entered another period of growth.

VII. Period of Sustained Growth: 1973 - 1996

During this period coal producing companies began to consolidate and become more productive and stronger financially. Today we do not have a hundred coal mines in Utah, but a handful; a handful which are more capable and productive than hundred mines of earlier years.

1. Coastal (ARCO)

Coastal Coal, which has recently been transferred from Coastal States Energy Company (CSEC) to Arco, operates three mines in Utah. CSEC acquired the Skyline reserves in 1978. In 1979, Getty Mineral Resources Company became a 50 percent joint venturer with CSEC in order to share the development costs. OSM issued CSEC, as the operator of the Skyline mines, a mining and

reclamation permit in June 1980. Skyline was designed to meet all the new environmental requirements and was the first new underground mine operation to be permitted under the new rules and requirements of the Surface Mining Control and Reclamation Act ("SMCRA"). In 1981, the construction of the coal handling facility, maintenance, warehouse and office complexes at the mine-site began for this multiple-seam mining operation. Construction of the rock slope, which provides conveyor belt access to the Lower O'Connor "A" seam, was well underway, and the mine No. III portals were completed, in 1981.

Skyline has evolved into a major Utah coal producer, with coal mining beginning in October 1981. In 1985, CSEC purchased Getty Mineral Resources Company's interest from Getty Oil Company, and the railroad loadout facility was completed. Total production in 1985 was 374,000 tons. The first unit train was shipped in September of 1985. Skyline installed the first longwall in the Fall of 1986, increasing annual production capacity to over two million tons, and a second longwall was added in late 1991, further increasing annual production capacity to over five million tons.

The Southern Utah Fuel Company ("SUFSCO") mine-site is located approximately 30 miles east of Salina, Utah, at the southern end of the

Wasatch Plateau in East Spring Canyon. The minesite is on United States Forest Service managed land with a rail loadout located 80 miles northwest of the mine on the Union Pacific railroad west of Levan, Utah. The elevation of the mine at the portal is 7,558 feet.

The coal reserve and mine surface facilities are all located in Sevier County, Utah.

SUFSCO began operations in 1941 as a small producer with production targeted at local markets and has evolved into a major longwall operation with a current production rate of approximately 4.2 million tons per year. SUFSCO's production from 1941 to 1973 was in the 50,000 to 100,000 ton per year range. Coal was sold primarily for home heating as well as some light industrial markets. SUFSCO expanded in 1970 to an annual production of 100,000 tons as a result of strengthening coal markets. Of note, SUFSCO has remained union-free throughout its existence.

CSEC acquired SUFSCO from the original developers in December 1974 and proceeded to increase SUFSCO's production significantly over the next 20 years. At the time of the acquisition, SUFSCO produced 360,000 tons per year. CSEC undertook an expansion program to increase production to more than 2.2 million annual tons, which was considered to be the optimum production level. CSEC attained this production level in 1982 using six continuous

miner sections with diesel haulage. In the late 1970s and early 1980s, SUFSCO's productivity ranked among the highest in the nation when compared with other mines using only continuous miners.

After reaching its initial production goal of 2.2 million tons in 1982, CSEC further increased SUFSCO's production through the conversion to longwall mining. SUFSCO installed a longwall mining system in October 1985, replacing four continuous miner sections and allowing for a 33 percent workforce reduction while maintaining the same production levels. Conversion to longwall mining, and the corresponding workforce reduction, was timed to coincide with the Skyline Mine expansion, thus allowing for some transfer of personnel. Production continued to increase from 1985 levels as SUFSCO improved longwall and continuous miner efficiencies, with production reaching 3.1 million tons in 1989. Production over the next seven years matched market demand, with production exceeding 3.9 million tons in 1995.

The most recent action in SUFSCO's expansion plan was the early 1995 purchase of additional shields and a new face conveyor to allow production from "super longwall" panels. The super panels were designed to be 930 feet wide and more than 14,000 feet long, each containing approximately six million tons of coal. SUFSCO produced 3.9

million tons in 1995 using the super panel technology. All the development for the super panels is currently being accomplished with one continuous miner section. Forecasted production for 1996 is 4.3 million tons at a productivity rate of 85 tons per man shift counting all SUFCO employees. (It should be noted that all CSEC tons per man shift figures incorporated herein include all employees, unlike MSHA statistics, which include underground personnel only.)

Soldier Creek Coal Company's ("Soldier Creek") Soldier Canyon Mine is located in Nine Mile Canyon of Carbon County, Utah approximately 11 miles northeast of the town of Wellington, Utah. The portal facilities are located on BLM land. The elevation of the minesite at the portal is 6,740 feet. Soldier Creek's Banning rail loadout is located 18 miles southeast of the Soldier Canyon Mine on the Sunnyside spur of the Southern Pacific Railroad.

The proposed Dugout Canyon Mine is located in Dugout Canyon of Carbon County, Utah approximately nine miles northeast of the town of Wellington, Utah with the proposed portal on fee property placed at an elevation of 7,075 feet. Both the Soldier Canyon Mine and the proposed Dugout Canyon Mine are within the same contiguous leasehold property located entirely in Carbon County.

The Soldier Canyon Mine's history dates to the

mid-1930s when a group of Carbon County residents opened the mine on a 40-acre federal lease. Since its development by the initial investors, Soldier Creek has had three owners, including CSEC most recently. California Portland Cement Company purchased the mine in 1975 to fuel its cement kilns in California and Arizona. California Portland Cement later merged with Conrock of California to form CalMat in 1984 and sold the mine to a subsidiary of Sun Company, Incorporated in 1985. Sun purchased the property because of its strategic location relative to Sun's adjacent coal reserves that is purchased in the Book Cliffs coal field in 1981 from Pacific Gas and Electric's Eureka Energy Company. The entire property, encompassing both the Soldier Canyon Mine and the undeveloped Eureka properties, was incorporated as Sage Point coal Company (Sage Point) under Sun. Sage Point is the parent of Soldier Creek.

CSEC acquired Soldier Creek (and its associated land company, Sage Point) from Sun Company, Incorporated in September 1993. CSEC's objective in acquiring Soldier Creek was to add another competitive coal company to CSEC's portfolio and allow further penetration into new and established markets. CSEC also saw opportunities to significantly increase the value of the Soldier Creek property for a modest capital investment. After the acquisition, CSEC undertook two

principal strategic initiatives: (1) to restructure the Soldier Canyon Mine in order to reduce costs and increase production and; (2) to develop the high-quality Dugout Canyon reserves. Soldier Creek has a current production capacity of 1.0 million tons and employs continuous miners with continuous haulage.

2. *UP&L (PacifiCorp)*

PacifiCorp, previously Utah Power and Light Company, operates two mines and owns three more mines which are not active at this time.

UP&L's involvement in coal mining began in 1972 with the acquisition of the Deseret Mine from the LDS Church. The Deseret Mine replaced North American Coal Company (Castle Gate) as coal supplier for the Carbon, Gadsby and Hale power plants. Management of the day-to-day mining operations at Deseret was contracted out to American Coal Company. The Mining and Exploration Department (M&E) was formed shortly thereafter to administer and oversee the company's main energy properties: coal and uranium. In 1969 Peabody Coal Company as the lease holder of the coal property and Malcolm McKinnon as the contractor opened up the Deer Creek Mine. He had also previously opened the Rilda Canyon and McKinnon Mine and was the original lease holder of the Skyline Mine which was sold to Utah Fuel Company. In 1976 UP&L purchased the

Deer Creek and Wilberg Mines from Peabody Coal Company, securing coal reserves for the Huntington and Hunter power plants. American Coal Company was again retained as independent contractor to operate these mines. The M&E Department administered these arms-length operating agreements, thus providing long-term planning and capital necessary to mine and protect the company's coal reserves.

Prior to the Deer Creek and Wilberg purchase, UP&L had entered into a long-term contractual relationship with Peabody Coal Company in 1971 to supply coal to the Huntington and Hunter Plants. The relationship began to deteriorate soon after as coal costs almost tripled from 1969 to 1976. In 1976 Peabody indicated that further increases were necessary to retain profitability and requested that the contract be renegotiated. At this point UP&L determined that the best alternative was to purchase the properties from Peabody based on the problems with long-term agreements, the future coal requirements of the plants, and the ability of the local coal market to supply the required tonnages at reasonable costs over the life of the plants.

The Deseret Mine began being replaced as the principle coal source for the Carbon, Gadsby and Hale plants in 1978 when contract purchases from Valley Camp Coal Company were instituted. In June 1979, a new contract

with Valley Camp was signed, eventually providing 100 percent of the coal requirements to these plants. Currently the coal reserves of the Deseret, Deer Creek and Wilberg Mines are totally dedicated to the Huntington and Hunter power plants. These mines are strategically located allowing coal deliveries to the Huntington Plant via a two-mile conveyor and to Hunter Plant by short truck haul roads (Wilberg 12.5 miles, Deseret 13.5 miles).

Production capacity has increased since the mines were first purchased to coincide with the addition of electric generating capacity at Huntington and Hunter plants. In May 1979, UP&L began installation of highly productive longwall mining equipment, eventually operating four longwall mining systems in 1981. The UP&L mines now comprise one of the most productive underground mining facilities in the West in addition to being the largest. Since installation of the first longwall mining system, advances in technology and operating techniques have further improved productivity to the point where two longwall systems are now providing the same tonnage as four previously did. This has allowed for significant cost savings reflected in current production costs falling far below previous years levels.

As mining progressed and coal reserves became further defined, additional reserves were acquired to meet expect-

ed burn requirements and provide for more logical mine development. In 1981, the Meetinghouse Canyon and Cottonwood properties were acquired and in 1985 the West Appa property was purchased, all adjacent to currently owned UP&L properties. The coal reserves secured to date are anticipated to fulfill the future lifetime requirements of both Huntington and Hunter plants.

American Coal Company operated the mines through April 30, 1979 until Emery Mining Corporation (EMC) purchased the operating agreements from American Coal Company. EMC guided operations through April 1986 bringing the UP&L properties into the longwall era, raising productivity, and significantly lowering costs. Although many accomplishments and improvements were realized, this period was not without problems and tragedy.

A small fire occurred in the Beehive Mine of the Deseret Mine complex in 1983 requiring sealing of the area to extinguish the fire. In 1984, the devastating Wilberg Mine fire occurred claiming 27 lives and suspended operations for over a year. Since the fires, both mines have been brought back to full production although the Deseret Mine complex is currently idle for economic reasons.

3. Cyprus Plateau

Cyprus Plateau Mining Corp. currently operates two mines and plans to complete the mining of the reserve in

Star Point Mine by the end of the decade and move completely to Willow Creek Mine site by the end of the decade.

Cyprus Plateau Mining Corp's Star Point No. 2 Mine, located 23 miles southwest of Price, is owned by Cyprus Amax Minerals Company. Star Point Mines' history dates back to 1916 when William Wattis and partners purchased 160 acres to open a mine in a canyon later to contain a small company town of the same name. Following various name and ownership changes, Cyprus purchased the property from Texaco in 1985. Since that time, the mine has expanded to its maximum extent as determined by geology and geomorphology. Remaining reserves are generally bounded by faults and additional adjacent reserves are not economically feasible to purchase from.

The Star Point No. 2 Mine presently produces approximately three million raw tons per year. Production is from three coal seams; the basal Hiawatha, the Middle or Third, and the upper Wattis Seams. Overburden ranges are up to about 1,900 feet. Working faces are approximately five to six miles from the portal and production is from two continuous miner sections and one longwall unit.

This mine was the first non-steel or non-utility owned company in the area to install longwall mining equipment (1982). Since that time, Plateau Mining Corp. has

been instrumental in helping develop and pioneer innovative mining technologies in the west including radio imaging, two-entry gate roads with yield pillar, cable bolting, and on-line responsive coal processing. A unit train loadout facility has enhanced Plateau's capacity to meet customer requirements.

Plateau Mining was recently awarded the Cyprus Amax "President's Award" for having the lowest incident rate of all Cyprus underground coal mines in 1995. As well as recovering the maximum amount of the in-place coal resource, mining coal in an environmentally safe and responsible manner is a priority at Cyprus Plateau. The company has shown that the coal resource can be mined with little environmental damage by thorough evaluation and proper planning. The Utah Division of Oil, Gas and Mining presented Cyprus Plateau with the 1995 Earth Day Award for exceeding regulations in developing Utah's resources.

In 1993, Cyprus decided to purchase additional reserves in Central Utah in order to be an active coal producer in the western U.S. As production at the Star Point No. 2 Mine is phased down, the workforce will be moved to the nearby newly developing Willow Creek Mine property.

The Willow Creek Mine is located approximately two miles north of the town of Helper, Utah in Carbon

County, near the old Castle Gate townsite in Willow Creek Canyon. The property consists of the Willow Creek Area to the east, the Castle Gate Area to the west, and the Heart area in the center. Mining in the Willow Creek and Heart areas will be in the three primary seams (D, K and A) and one secondary seam (C).

This property was first investigated by Plateau in 1987. A detailed acquisition study of the Blackhawk Reserve (Willow Creek Area) was completed in-house. With increased production from the Star Point Mine in the early 1990s, the property became a target for acquisition. A detailed investigation into the reserve was initiated and resulted in two formal reports being written. These reports, coupled with a detailed financial analysis, resulted in the leasing of this property from American Electric Power (AEP) in the Fall of 1993.

With the merger of Amax and Cyprus shortly after the leasing of the Blackhawk property, Amax's adjacent Castle Gate Mine property was evaluated. It was determined that most of the reserves on this property (west of Willow Creek) could be accessed in future years by acquiring a new federal coal lease. This lease, named the Willow Creek North Lease, is contiguous to both properties and contains significant additional quantities of recoverable coal. At this point, the feasibility of longwall mining

was determined, and the Willow Creek North Lease was pursued. Previous studies, recent drilling results, and recent rock mechanics studies all support the plan to develop a mine with one longwall section and two continuous miner sections. The proposed layout would allow the mine to produce a base of five million tons annually.

Willow Creek Mine will allow Cyprus Plateau Mining Corp. to grow from a three million ton per year producer to a base of five million tons per year, and provide the reserves to grow with market demands. The present 15-year mine plan will access the three principal coal seams mentioned. The average cover for the base mine plan will be less than 2,000 feet. By expanding the minable cover to 2,500 feet, an additional 10 years of production is possible. The quality of the Willow Creek coal is very similar to Star Point coal and will be sold both domestically and internationally.

4. *Andalex Resources*

Andalex Resources owns three mines; only one of them is active at this time. Andalex is also a half owner and operator of another mine (Genwal)

In 1976, Andalex Resources acquired the Centennial Development Company's leases in the Book Cliffs coal field under the name of AMCA Coal Leasing.

Subsequently, Tower Resources was incorporated to start work on the leases. From

the Summer of 1977 to the Spring of 1980, Tower Resources went through reserve evaluation, mine planning, permitting process and market development.

In the Spring of 1980, Tower Resources started its mine development with surface facilities. In the Fall of 1980, Tower began mining with a continuous miner in the Gilson seam of Pinnacle Mine. This was the first mine to be opened.

Operation of Tower Resources grew more rapidly in 1982 with the opening of the second mine, Apex Mine, which started to produce coal from the lower Sunnyside seam.

The third mine by the name of Aberdeen opened in 1990. Now the entire operation of Andalex Resources (Tower Division) is concentrated on the Aberdeen Mine, though both Pinnacle and Apex have small reserves left.

Andalex also expanded its lease holdings through leases by application and also by lease modification.

5. *Genwal Coal Company*

Genwal operates the Crandall Canyon Mine and it is equally owned at present by IPA and Andalex. The Crandall Canyon Project consists of the operating Crandall Canyon Mine, coal properties, and Mohrland loadout located in Emery County, Utah. The Crandall Canyon Mine currently produces 2.6 million tons of clean coal per year uti-

lizing continuous miners, continuous haulage and longwall mining methods. The Crandall Canyon Mine is planning expansion to allow for production to increase to 3.5 million tons of annual production.

The Crandall Canyon Project is jointly owned by the Intermountain Power Agency (IPA), a political subdivision of the state of Utah, and Andalex Resources, Inc., a Utah corporation (GRI) for the operation of the Crandall Canyon Mine and coal properties.

The Crandall Canyon Mine is located 17 miles northwest of Huntington, Utah within the boundaries of the Manti-LaSal National Forest of the Wasatch Plateau mountain range. The portal elevation is 8,000 feet above sea level.

The first coal mined on the current Crandall Canyon Project property was in July of 1939. The mine at that time was known as the Tip Top Mine and was operated by James L. Peterson from Fairview, Utah.

The Crandall Canyon Mine as it is known today was reopened in 1984 by the Bud Gent family of Virginia forming Genwal Coal Company. The original mine was located on a small federal coal lease of 300 acres which provided access to the Hiawatha coal seam. The mine has since been expended on to additional state and federal coal leases.

In 1988, Genwal Coal

Company and the Crandall Canyon Mine were purchased by Nevada Electric Investment Company ("NEICO"). NEICO expanded the mine's production from 214,000 annual tons in 1988 to 877,000 annual tons in 1991.

On July 1, 1991, IPA purchased a 50 percent undivided interest as tenant in common with NEICO. The IPA and NEICO joint ownership formed the Crandall Canyon Project. In January 1994, Andalex Resources purchased NEICO's half of Genwal and formed Genwal Resources Inc. Production from the Crandall Canyon Mine continues to increase and in 1996 an estimated 2.6 million tons will be produced.

The Crandall Canyon Mine has successfully implemented continuous miner, continuous haulage and long-wall mining methods. The Crandall Canyon Mine is a quality geological coal reserve featuring a low ash, low sulfur, high Btu clean coal. The mine is staffed with a highly motivated, experienced, qualified and hard working work force.

6. *White Oak Mining & Construction Company*

White Oak Mining and Construction Company of Kentucky bought the Balina mines from Valley Camp of Utah, a subsidiary of Quaker Oil Company in late 1993 and started to produce and market the Balina Mine coal very successfully. The mine was also renamed White Oak.

7. *Co-op Coal Company*

Co-op Mining has kept its operation and marketing to a very manageable size. It is operating totally on fee land and can continue this scale of operations with its existing reserves for years to come.

Today the underground coal industry in Utah is a model for the entire country. The level of productivity of Utah's coal miners is the highest of the industry. Utah's high quality coal and our coal operators' ability to respond to changing market conditions have allowed Utah's coal industry to remain competitive and grow during a time of falling prices and industry contraction.

The demonstrated resourcefulness of Utah's coal industry in continuing to expand during the last 10 years suggests the continued success of the industry is limited only by access to Utah's coal resources and demand for high quality coal. Utah should remain a leader of the underground coal industry in this country.

Table 1 **Historical Production, Distribution and Consumption of Coal in Utah**
Thousand Short Tons

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
PRODUCTION	16,912	11,829	12,259	12,831	14,269	16,521	18,164	20,517	22,012	21,875	21,015	21,723	24,422	25,051	27,338
DISTRIBUTION	15,397	12,188	12,074	14,361	13,243	16,989	18,244	20,289	21,680	21,673	21,339	21,935	23,441	25,443	28,207
E U OUTSIDE UTAH	3,643	3,404	3,730	3,746	2,989	3,182	2,797	2,623	3,373	3,608	4,000	3,914	4,841	6,570	7,680
E U IN UTAH	6,153	5,220	4,912	7,385	7,614	11,677	12,533	12,963	14,053	13,472	13,136	13,343	13,839	12,550	12,253
C P OUTSIDE UTAH	859	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C P IN UTAH	831	886	1,392	1,328	868	291	1,259	1,277	1,296	1,310	1,182	1,089	1,198	1,062	1,060
IND OUTSIDE UTAH	1,349	1,091	1,542	1,866	1,745	1,813	1,996	2,401	2,327	2,158	2,006	2,146	2,322	2,399	2,446
IND IN UTAH	812	664	551	450	374	349	739	810	619	624	497	614	647	642	672
R/C OUTSIDE UTAH	233	292	311	312	81	83	88	84	59	76	81	134	308	68	63
R/C IN UTAH	177	191	258	252	191	204	236	323	382	320	347	228	157	182	100
OVERSEAS EXPORTS	2,177	1,346	849	625	551	555	1,044	2,175	1,708	2,112	2,245	2,567	2,717	3,811	5,772
TOTAL IMPORTS	797	937	1,539	1,580	1,145	1,165	2,448	2,367	2,137	2,007	2,155	2,100	2,588	1,841	2,110
IMPORTS E U	18	0	224	193	659	905	1,300	1,400	1,449	1,310	1,517	1,501	1,495	779	1,050
IMPORTS C P	695	854	1,229	1,289	383	160	1,088	922	679	695	629	579	1,089	1,062	1,060
IMPORTS IND	84	83	85	98	103	100	60	45	7	2	9	20	4	0	0
IMPORTS R/C	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
COAL OPERATORS	16	15	15	15	16	16	14	14	13	12	12	11	10	9	9
ACTIVE MINES	29	25	21	21	21	18	21	20	18	16	16	15	14	12	12
EMPLOYEES	4,296	2,707	2,525	2,563	2,881	2,650	2,559	2,471	2,791	2,292	2,106	2,161	2,024	1,989	2,013
PRODUCTIVITY, T/MH	2.05	2.59	2.94	2.8	3.08	3.25	3.69	4.42	4.22	4.79	5.13	5.43	6.22	6.94	6.95
AVERAGE PRICE \$/TON	\$29.42	\$28.32	\$29.20	\$27.69	\$27.64	\$25.67	\$22.85	\$22.01	\$21.78	\$21.56	\$21.83	\$21.17	\$20.07	\$19.11	\$18.75
TOTAL VALUE \$1,000,000	\$498	\$335	\$358	\$355	\$394	\$417	\$415	\$451	\$479	\$472	\$459	\$460	\$490	\$479	\$513

Values for 1996 are forecast.
All distributions include imports. EU=Electric Utilities. CP=Coke Plants. IND=Industrial. R/C=Residential and Commercial.

Table 2

Utah Coal Production by Coal Field

Thousand Short Tons

	Wasatch Plateau	Book Cliffs	Emery	Sego	Coalville	Others	Total
1870-1981	166,404	234,547	5,723	2,654	4,262	2,332	415,922
1982	12,342	3,718	852	0	0	0	16,912
1983	10,173	1,568	88	0	0	0	11,829
1984	10,266	1,993	0	0	0	0	12,259
1985	9,386	2,805	640	0	0	0	12,831
1986	10,906	2,860	503	0	0	0	14,269
1987	13,871	2,348	269	0	33	0	16,521
1988	15,218	2,363	548	0	35	0	18,164
1989	17,146	2,785	586	0	0	0	20,517
1990	18,591	3,085	336	0	0	0	22,012
1991	18,934	2,941	0	0	0	0	21,875
1992	18,631	2,384	0	0	0	0	21,015
1993	19,399	2,324	0	0	0	0	21,723
1994	22,079	2,343	0	0	0	0	24,442
1995	22,631	2,420	0	0	0	0	25,051
1996	24,187	3,151	0	0	0	0	27,338
Cumulative Production	385,977	270,484	9,545	2,654	4,330	2,332	675,322

1996 values are forecast and are not included in the total

Table 3

Utah Coal Production by County Thousand Short Tons

	Carbon	Emery	Sevier	Summit	Iron	Kane	Others	Total
1870-1959	211,028	49,166	4,046	4,012	521	45	2,846	271,664
1960	3,698	1,137	49	20	50	0	1	4,955
1961	3,916	1,124	47	20	52	0	0	5,159
1962	3,105	1,077	49	20	46	0	0	4,297
1963	3,493	752	47	18	48	1	0	4,359
1964	3,752	848	47	17	54	2	0	4,720
1965	3,779	1,101	61	13	36	2	0	4,992
1966	3,380	1,170	65	15	4	2	0	4,636
1967	2,971	1,113	72	13	3	2	0	4,174
1968	3,062	1,167	70	13	3	2	0	4,317
1969	3,367	1,200	72	12	4	2	0	4,657
1970	3,349	1,292	79	13	0	0	0	4,733
1971	3,347	1,097	158	12	0	12	0	4,626
1972	2,956	1,656	184	6	0	0	0	4,802
1973	2,866	2,445	339	0	0	0	0	5,650
1974	2,754	2,901	391	0	0	0	0	6,046
1975	2,984	3,126	827	0	0	0	0	6,937
1976	3,868	3,057	1,043	0	0	0	0	7,968
1977	4,390	3,107	1,337	0	0	0	4	8,838
1978	4,005	3,640	1,558	0	0	0	50	9,253
1979	5,292	5,147	1,657	0	0	0	0	12,096
1980	5,096	6,319	1,821	0	0	0	0	13,236
1981	6,123	5,609	2,076	0	0	0	0	13,808
1982	8,335	6,329	2,248	0	0	0	0	16,912
1983	4,194	5,404	2,231	0	0	0	0	11,829
1984	5,293	4,825	2,141	0	0	0	0	12,259
1985	6,518	4,516	1,797	0	0	0	0	12,831
1986	6,505	5,404	2,360	0	0	0	0	14,269
1987	7,495	6,765	2,228	33	0	0	0	16,521
1988	7,703	7,801	2,625	35	0	0	0	18,164
1989	8,927	8,531	3,059	0	0	0	0	20,517
1990	8,810	10,315	2,887	0	0	0	0	22,012
1991	5,816	12,980	3,079	0	0	0	0	21,875
1992	3,386	15,049	2,580	0	0	0	0	21,015
1993	2,642	15,528	3,553	0	0	0	0	21,723
1994	4,523	16,330	3,569	0	0	0	0	24,422
1995	3,801	17,344	3,906	0	0	0	0	25,051
1996	5,325	17,923	4,090	0	0	0	0	27,338
Total	376,529	236,372	54,358	4,272	821	70	2,901	675,323

Table 4

Utah Coal Production by Landownership Thousand Short Tons

	Federal Land		State Land		County Land		Fee Land		Total
	Production	Percentage	Production	Percentage	Production	Percentage	Production	Percentage	
1980	8,663	65.5%	1,105	8.3%	0	0.0%	3,468	26.2%	13,236
1981	8,719	63.1%	929	6.7%	0	0.0%	4,160	30.1%	13,808
1982	10,925	64.6%	998	5.9%	0	0.0%	4,989	29.5%	16,912
1983	6,725	56.9%	419	3.5%	0	0.0%	4,685	39.6%	11,829
1984	8,096	66.0%	285	2.3%	0	0.0%	3,878	31.6%	12,259
1985	9,178	71.5%	510	4.0%	0	0.0%	3,143	24.5%	12,831
1986	11,075	77.6%	502	3.5%	0	0.0%	2,692	18.9%	14,269
1987	13,343	80.8%	488	3.0%	0	0.0%	2,690	16.3%	16,521
1988	15,887	87.5%	263	1.4%	0	0.0%	2,014	11.1%	18,164
1989	16,931	82.5%	375	1.8%	153	0.7%	3,058	14.9%	20,517
1990	17,136	77.8%	794	3.6%	606	2.8%	3,476	15.8%	22,012
1991	18,425	84.2%	942	4.3%	144	0.7%	2,364	10.8%	21,875
1992	17,760	84.5%	1,384	6.6%	136	0.6%	1,735	8.3%	21,015
1993	19,099	87.9%	1,682	7.7%	116	0.5%	826	3.8%	21,723
1994	22,537	92.3%	1,227	5.0%	243	1.0%	415	1.7%	24,422
1995	23,730	94.7%	571	2.3%	289	1.2%	461	1.8%	25,051
1996	25,944	94.9%	574	2.1%	301	1.1%	519	1.9%	27,338

1996 value are forecast

Table 5

Distribution of Utah Coal 1995 By Destination and End-Use, Thousand Short Tons

Destination	Electric Utilities	Other Industrial	Residential & Commercial	Total
Arizona	0	80	0	80
California	1,151	1,699	0	2,850
Colorado	0	12	2	14
Idaho	0	109	19	128
Illinois	1,546	0	0	1,546
Michigan	0	182		182
Montana	0	3	6	9
Missouri	389	0	0	389
Nevada	2,024	205	1	2,230
Oregon	188	1	1	190
Pennsylvania	9	0	0	9
Tennessee	1,118	0	0	1,118
UTAH	11,771	642	182	12,595
Washington	51	86	39	176
Wisconsin	94	0	0	94
Wyoming	0	22	0	22
Pacific Rim	3,811	0	0	3,811
Total	22,152	3,041	250	25,443