

1991 Annual Review and Forecast of

UTAH COAL

Production and Distribution

November 1992

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Executive summary

Utah coal production is now at a historical peak and will remain at that level for the next two to three years on the strength of its historical markets. Production may increase in the future as demand for "compliance" coal increases in Eastern and Midwestern electric utility markets. For 1992, the production of Utah coal is expected to range between 21.5 million tons and 22.2 million tons.

Utah's 1991 coal production of 21.9 million tons almost matched the 22-million-ton production of 1990, which was the all-time record for Utah coal production. In 1991, Utah's underground coal mines remained the most productive in the United States. Productivity of Utah coal miners soared to a new high of 44 tons per man day, an impressive 31 percent increase over 1990 productivity.

This high productivity, however, was not without cost to both coal operators and coal miners. Coal operators invested more capital to increase productivity. Coastal States Energy Company, for example, spent \$25 million to install a new longwall unit in its Skyline mine, which at the time of installation was the most productive longwall machine in the world. Coal miners also worked hard to achieve this efficiency even though it cost some of them their jobs.

In the near term, increased mechanization in Utah coal mines will result in a slight decrease in work force. However, toward the end of the decade, expansion of Utah's coal industry to meet the de-

mand for overseas exports and "compliance" coal in Eastern and Midwestern utility markets will likely lead to a work force increase.

In 1992, production will decrease by less than 3 percent. Coal prices will likely remain within 1 percent of 1991 prices, putting the value of total coal produced in Utah at about \$470 million — the same as last year. Productivity should also rise as less productive mines curtail operation while more productive mines assume an increased share of total production.

Distribution of Utah coal during 1991 remained almost the same as 1990 levels. Distribution of Utah coal to end-users in 1991 was 21.6 million tons. The most significant decrease in distribution to an end-use sector was to Utah electric utilities. The decrease is attributed solely to reduced demand for coal-generated electricity due to the availability of low-cost hydropower from the Pacific Northwest.

Shipment to coal-fired electric utilities in Utah, other states and overseas totaled 17.9 million tons. Shipment to Utah coal-fired electric utilities accounted for 68 percent or 12.2 million tons. A total of 3.6 million tons or 20 percent was shipped to electric utilities in the Western states, and 2.1 million tons or 12 percent was exported to the Pacific Rim countries of Taiwan, Japan, Korea and Hong Kong.

In 1992, distribution to the electric utility industry is projected to increase from 17.87 million tons to 17.92 million tons. Utah consumption is expected to decrease by 0.67 million tons, but consumption by other states will increase by 0.1

million tons. Overseas exports will increase by about 0.6 million tons.

Distribution of Utah coal to coke plants in 1991 was nearly the same as the previous year. During 1990, a total of 617,000 tons of Utah coking coal was shipped to the Geneva Works steel mill in Orem, Utah. In 1991, shipment to Geneva totaled 615,000 tons.

Total Utah coal distributed to other industrial users amounted to 2.8 million tons in 1991, compared to 2.9 million tons the previous year. Of this, 622,000 tons were distributed in Utah compared to 612,000 tons in 1990. The remaining 2.2 million tons were shipped primarily to Nevada and California, as compared to 2.3 million tons in 1990. During 1992, the demand for Utah coal by coke plants could increase by as much as 6 percent. On the other hand, the demand for other industrial coal could decrease by 3 percent from 2.8 million tons to just over 2.7 million tons.

Distribution to the residential and commercial end-use sector, which had been rising since the low of 271,000 tons in 1986, experienced a small decrease from 441,000 tons in 1990 to 396,000 tons in 1991. Historically, this sector has accounted for between 2 and 4 percent of total distribution. During 1991, it was just over 1.8 percent. About 80 percent of this coal is consumed in Utah with the remaining 20 percent shipped in almost equal volumes to California, Idaho and Washington. The distribution of Utah coal to the residential and commercial end-use sector is projected to decrease from 396,000 tons in 1991 to 338,000 tons in 1992.

1991 Utah coal production

Production of coal in Utah was just under the 22-million-ton mark during 1991, the second highest production level in 122 years of recorded Utah coal operations. Only during 1990 did Utah mines produce more coal. Gross production was 22,410,000 tons and net production was 21,875,000 tons (Appendix, Table 1).

Even though the production of coal in Utah was nearly that of the previous year, there were 499 fewer miners employed by the coal industry. Employment fell from 2,791 in 1990 to 2,292 in 1991, by far the lowest level of employment of the past decade; even lower than 1983 when Utah only produced 11.3 million tons of coal or almost half that of 1991 production.

Utah coal miners continued to lead the nation in productivity from underground coal mines. They were more productive than miners in 75 percent of the states using surface mining methods. Utah's previously unparalleled productivity increased by 31 percent in 1991.

The Wasatch Plateau coal field, proven to be the most prolific coal producer of the '80s, was again the major producing coal field in 1991, accounting for more than 86 percent of Utah's total coal production. The remainder came from the Book Cliffs coal field. The Emery coal field produced nothing during 1991. During 1992, more coal will be produced from the Wasatch Plateau coal field and less from the Book Cliffs coal field, with no production from the Emery coal field (Appendix, Table 2).

Coal production was more evenly distributed by county than

Utah coal industry production, employment and prices

Year	Production Million short tons	Employment No. of employees	Prices \$/ton
1981	13.80	4,166	26.87
1982	16.91	4,296	29.42
1983	11.82	2,707	28.32
1984	12.25	2,525	29.20
1985	12.83	2,563	27.69
1986	14.26	2,881	27.64
1987	16.52	2,650	25.67
1988	18.16	2,559	22.85
1889	20.51	2,471	22.01
1990	22.01	2,791	21.78
1991	21.87	2,292	21.56
1992	21.52	2,216	21.81

1992 values are forecast.

by coal field. Carbon County again produced more than 10 million tons of coal. Emery County's production fell from a record 9.0 million tons the previous year, to 8.8 million tons in 1991. Production from Sevier County hit an all-time high of 3.1 million tons, passing the 3-million-ton mark for only the second time (Appendix, Table 3).

During 1991, production from federal leases increased for the eighth year in a row, passing the 18-million-ton mark. Not only was this the largest volume of coal ever produced from federal leases in Utah, but it also represents the second largest percentage of total coal production. Production from state land was also a record amount at 942,000 tons or 4.3 percent of the total production. Coal production from county land fell to one quarter of the previous year.

Coal production from fee land fell from 3.5 to 2.4 million tons (Appendix, Table 4).

During 1991, a total of seven operating longwall panels were responsible for 57 percent of total production or 12,566,000 tons. This amounted to 1.8 million tons of coal production per panel per year. Considering one of the longwalls was not in operation during the entire year and another was not producing at full capacity because of market constraints, it would be safe to conclude that on average each longwall produced 2.2 million tons per year. A total of 9,309,000 tons of coal was produced by 36 continuous miners for an average of more than a quarter of a million ton per year per machine.

Utah coal markets and distribution of coal in Utah

During 1991, distribution of coal produced in Utah was only a fraction off 1990 levels. Distribution of Utah coal to end-users in Utah was 13.7 million tons, about 600,000 tons less than in 1990. The distribution to end-users in other states totaled 5.8 million tons, about 100,000 tons more than in 1990. Overseas exports amounted to 2.1 million tons, about 400,000 tons above 1990 exports.

Electric utility markets

Until 1973, coke plant and other industrial consumption of Utah coal were each greater than electric utility consumption. However, in that year electric utility consumption surpassed industrial consumption and the following year it also surpassed coke plant consumption. Today the electric utility industry remains the largest market for Utah coal with consumption more than four times the sum of all the other consuming sectors.

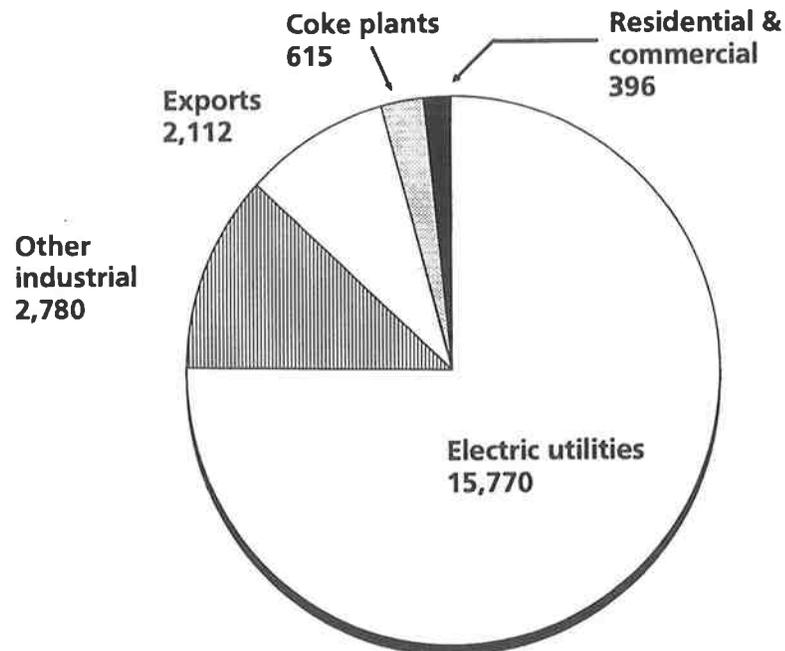
Out-of-state markets

Distribution to out-of-state markets during 1991 was 6 percent above 1990 levels. A total of 3.6 million tons of Utah coal was shipped to coal-fired power plants and cogeneration facilities in Nevada and California with smaller amounts going to Arizona and Illinois.

In Nevada, three electric power generation facilities burn bituminous or subbituminous coal. Two of these plants, the Nevada Power Co.'s Reid Gardner Plant and Sierra Pacific Power Co.'s North Valmy Plant, burn Utah coal. The four units of the Nevada Power's Reid Gardner Plant, with a cumulative ca-

1991 distribution of Utah coal by consuming sector

Thousand short tons



capacity of 612 megawatts (MW), rely almost entirely on Utah coal. Shipments of coal to this plant totaled 1.7 million tons in 1991, a 6 percent increase over the 1.6 million tons delivered in 1990. All of the requirements of this plant are purchased under long-term contracts, many of which were revised as recently as the last three years. There is little competition for this coal and the volume of Utah coal shipped to this plant should remain quite stable, increasing slightly.

The two units of the Sierra Pacific Power Co.'s North Valmy Plant have a combined generation capacity of 521 MW. This plant requires about 1.45 million tons of coal per year. Utah mines supply 60 percent of the plant's coal, with

Wyoming mines supplying the remaining 40 percent. In 1991, Utah coal shipments to the North Valmy Plant totaled about 879,000 tons, an increase of 3 percent over 1990. Wyoming shipped 571,000 tons. These two coals are similar in price and quality and are of equal geographical distance from the North Valmy Plant. Neither one demonstrates a significant competitive advantage over the other to expect a change in the share each supplies to the North Valmy Plant in the near future.

A third coal-fired plant, one that does not burn Utah coal, is the Southern California Edison Co.'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. At this time, Black Mesa coal is probably the only viable coal supply for shipment. However, competition for a share of Mojave's coal supply could occur if and when coal from Utah's southern coal fields becomes available.

Besides Nevada's electric utilities, more than 1.0 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 seven coal-fired cogeneration units operating in Southern California. Stockton, California is the site of the first coal-fired cogeneration facility 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 gigawatt hours (GWh) of electricity. In 1991, this plant purchased 230,000 tons of coal, 174,000 tons of that came from Utah. Some of the electricity and all of the steam by-product were utilized by an adjacent corn wet milling plant owned by Corn Product Co. International. The re-

maining electricity was sold to Pacific Gas and Electric Co.

In May 1989, a second coal-fired cogeneration facility was commissioned. It is owned by Mt. Poso Cogeneration Co., a consortium of Pyropower Development Corp. (Ahlstrom Development Corp. as of July 1, 1991), 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 Co. and Pacific Generation Co. During 1991, this unit purchased 226,000 tons of Utah coal and burned 213,000 tons to generate 394 GWh of electricity that was sold to Pacific Generation Co. The steam by-product was used for enhanced oil recovery in Mt. Poso Field-West.

The largest coal-fired cogeneration facility in California, with 96-MW of installed electric generation capacity, is owned by ACE Cogeneration Co., which is owned by Pyropower Development Corp., Constellation Holding Inc., and Kerr McGee Chemical Co. This cogeneration unit is located in Trona, California, and started operation in September 1990 under Kerr McGee Chemical Co., whose 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 600 to 650 GWh of electricity. During 1991, it purchased 325,000 tons of Utah coal and burned 306,000 tons to generate 584 GWh of electricity that was purchased by Southern California Edison Co.

GWF Power Systems L.P. started operating its 23-MW capacity cogeneration unit during late 1990. This unit can burn 100,000 tons of coal to generate 220 GWh of electricity. The initial fuel used in this facility was Utah coal. But, a

mixture of petroleum coke and natural gas has replaced Utah coal as the primary source of fuel. The steam by-product and about 15 percent of the electricity is used at the "across-the-street" facility of Pirelli-Armstrong Tire & Rubber Co. and the remaining 85 percent of the electricity is sold to Pacific Gas and Electric Co. The prospect of this plant switching back to Utah coal for its primary fuel source is remote.

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 Dec. 28, 1987 and was completed on March 23, 1990. The plant's first start-up was on Sept. 27, 1989 and it went on-line early in 1990.

During 1991, Rio Bravo Poso purchased 140,000 tons of Utah coal and burned 136,000 tons to generate 266 GWh of electricity that was sold to Pacific Gas and Electric. The steam by-product was used in enhanced oil recovery in the area. Rio Bravo Jasmin purchased 132,000 tons of Utah coal and burned 128,000 tons to generate 257 GWh of electricity that was sold to Southern California Edison. The steam by-product of this unit was also used for the enhanced oil recovery.

Another cogeneration plant, Energy Factor, is located in Stockton. This 45-MW cogeneration plant was purchased by Sithe Energy in January 1990. The steam by-product from this plant goes to various manufacturing facilities in the area. This plant can use about 200,000 tons of coal per year. The coal supply contractor of this company is with Pacific Basin Resources, a division of Oxbow Carbon & Minerals of Colorado. During 1991, this company purchased 160,000 tons of coal, 40,000 tons or 25 percent of

which came from various Utah coal suppliers. The electricity generated was purchased by Pacific Gas and Electric.

Shipments of coal for consumption by electric power plants in Nevada are anticipated to remain the same in 1992 as in 1991. Shipments to California could go up by about 100,000 tons. Should this oc-

cur, Utah Power's Hunter I, II, and III, with availability of 90 percent and utilized availability of 96.6 percent, consumed 4.1 million tons of coal to generate 8,925 GWh of electricity. This coal was produced by Cottonwood mine.

Huntington I and II, with plant availability of about 85.5 percent and utilized availability of over 97.2

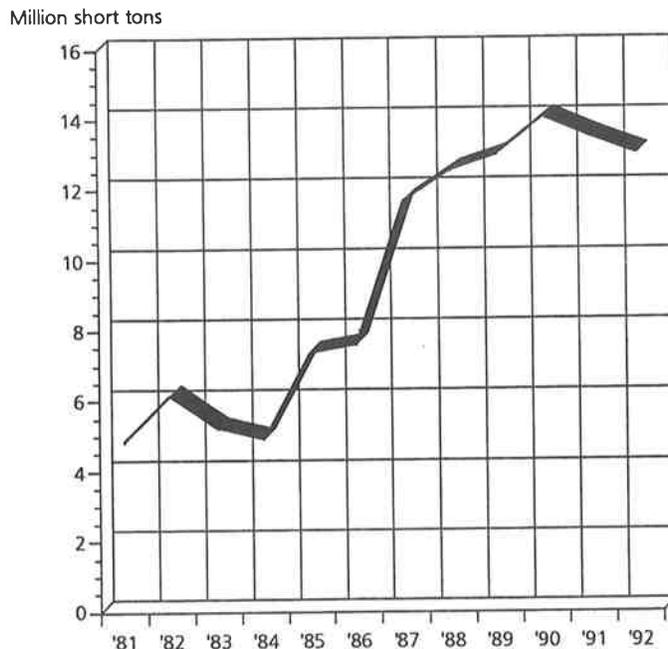
duce coal costs. For the second half of 1991, Coastal States Energy was the major supplier, with Cyprus Plateau Coal Co. and Castle Valley Resources each having an equal share of the remainder.

It is very likely that the utilized plant availability for Utah Power could be slightly higher in 1992 than in 1991, and coal consumption could surpass 7.3 million tons. However, coal produced for distribution to Utah electric utilities is likely to decrease by half-a-million tons in 1992. Utah Power's Hunter and Huntington plants currently have large stockpiles of coal on site. The plants are expected to draw a portion of their 1992 coal requirements from these stockpiles, reducing their receipts of Utah coal.

During 1991, the Intermountain Power Agency (IPP) plants I and II operated at a cumulative capacity factor of 71.8 percent, with availability of 93 percent. The two units consumed just over 4.1 million tons of coal to generate 10,074 GWh of electricity. About 90 percent of this coal was purchased through five long-term contracts; the remainder was purchased on the spot market. All the generated electricity was sold outside the state. During 1992, the amount of coal used is expected to increase considerably. IPP will probably use 4.8 million tons of coal to generate 12,300 GWh of electricity.

In addition to IPP, Deseret Generation and Transmission's Bonanza Plant did not operate at or near full capacity in 1991. The plant, with rated peak capacity of 420 MW, had an availability of 100 percent during 1991 and a gross capacity factor of 75.9 percent. It consumed 1.31 million tons of Colorado coal to generate 2,766 GWh of electricity, 60 percent of which was sold outside the state. This coal is purchased from the DeSerado mine located 36 miles

Distribution of coal to Utah electric utilities



1992 value is forecast.

cur, Utah coal distributed out-of-state to generate electricity would increase from 3.6 million tons in 1991 to about 3.7 million tons in 1992.

Utah markets

Total coal consumed in Utah to generate electricity amounted to nearly 12.8 million tons in 1991 (coal shipped to the electric utility plants was 13.472 million tons). Coal consumed by coal-fired electric power plants in Utah during 1991 was lower than expected.

percent, consumed about 2.7 million tons of coal to generate 5,859 GWh of electricity. This coal was produced by Deer Creek mine. The Carbon Plant, with availability of 90.3 percent and utilized availability of almost 87.2 percent, consumed more than 548,000 tons of coal to generate 1,193 GWh of electricity. The coal for this plant was purchased on the spot market by competitive bids from various companies. Going to the spot market to meet the coal needs of its Carbon plant helped Utah Power re-

east of the plant. During 1992, the percent of availability will decrease to 99 percent due to scheduled maintenance and the gross capacity factor should increase to 87 percent. The plant is projected to consume 1.5 million tons of coal to generate 3,222 GWh of electricity.

At this time no construction is under way on new coal-fired generation plants in Utah. The coal-fired power plants that are currently shut down are not expected to reopen, with the exception of Gadsby No. III, which has been converted to use natural gas.

Therefore, distribution of electric utility coal in Utah is projected to be around 13.0 million tons with consumption nearing 13.7 million tons in 1992. The distribution is expected to eventually increase to 14.0 million tons per year and remain at that level until new coal-fired generation capacity is built in Utah.

Utah coking coal markets and coke plants

The market for Utah-produced coking coal is limited to Geneva Works steel mill, Orem, Utah, owned by Basic Manufacturing and Technology of Utah Inc. Coal purchased by Geneva Works during 1991 totaled 1.31 million tons. The plant consumed a total of 1.265 million tons for steel production. Utah mines provided 615,000 tons of high-volatile coking coal, or 47 percent of the plant's total consumption. The remaining 53 percent or 695,000 tons was purchased from outside Utah.

More than 171,000 tons of coking coal was purchased from Bear Coal Co. Inc. of Somerset, Colorado. Bear Coal Company coal is mined from the same seam of coal as previously purchased from the Somerset mine prior to its closure. Mid-Continent Resources, Inc. of Carbondale, Colorado did not

provide any coal to Geneva Works in 1991. Geneva Works also purchased 292,000 tons of low-volatile coking coal from Cooney Brothers Coal Co. of Cresson, Pennsylvania, about 250,000 tons of which was consumed in 1991. It also purchased 232,000 tons of mid-volatile coking coal from United Coal Co. of Bristol, Virginia, of that about 230,000 tons was consumed in 1991.

The consumption of coking coal by Geneva Works should not change in 1992. It is expected that 620,000 tons of Utah coal, plus 680,000 tons of coal from other sources outside Utah will be purchased and consumed by Geneva Works in 1992.

Other industrial coal markets

Out-of-state markets

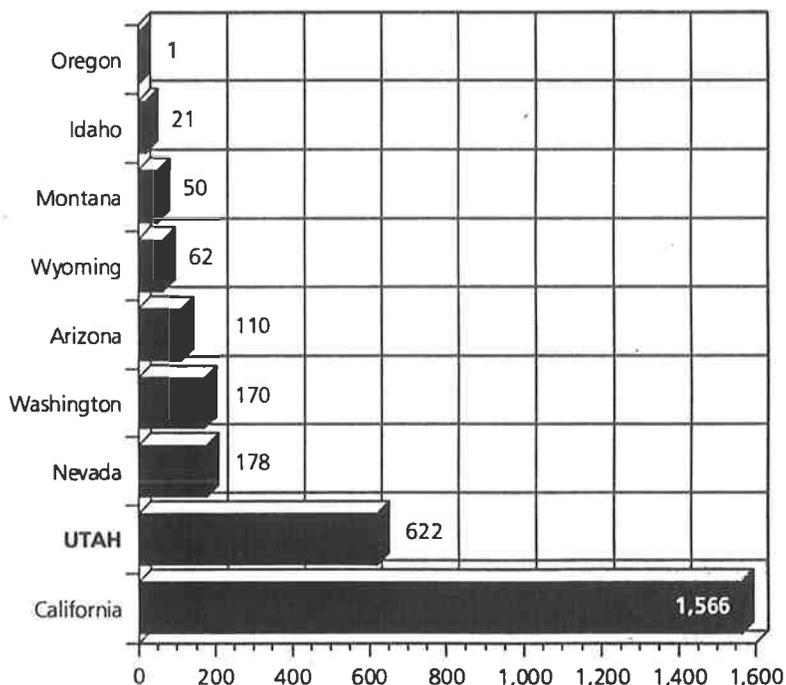
Since 1987, shipment of coal to other states for industrial use

had increased each year. This trend was reversed in 1990 and 1991 due to the June 5, 1989 closure of Castle Gate Coal Co. A total of nine operators shipped 2.158 million tons of industrial coal out of the state in 1991, with five of them shipping more than 100,000 tons each. The primary end-use of industrial coal shipped out-of-state was for consumption by cement and chemical plants in California. Seventy-three percent of Utah coal shipped out-of-state for industrial use went to California. The remaining coal was shipped to seven other states. Nevada received 8 percent, Washington, 8 percent, Arizona, 5 percent, Wyoming, 3 percent, Montana, 2 percent and Idaho, 1 percent. A small amount of coal was also shipped to Oregon.

California, as previously mentioned, received more than 1.0 million tons of electric utility coal to fuel cogeneration units. The steam

1991 distribution of Utah industrial coal by state

Thousand short tons



by-product of some of these cogeneration units was used in the same facilities that purchased their industrial coal from Utah. While this tended to reduce the requirement of *industrial* steam coal for some of these plants, most of the cogeneration steam was used to increase production at these facilities rather than reduce industrial coal consumption.

The shipment of Utah industrial coal to out-of-state customers in 1992 is expected to decrease to 1.9 million tons.

Utah markets

Industrial coal consumption in Utah increased to 624,000 tons in 1991, up 1 percent from 1990 consumption of 619,000 tons. Kennecott Copper Division of RTZ decreased its consumption by 19 percent to 299,450 tons in 1991 to generate 631 GWh of electricity for its own use. Electricity generation was fueled by coal for 10 months and by natural gas for two months. In 1992, Kennecott will burn about 280,000 tons of coal for eight-months and natural gas for four months.

The Devil's Slide Plant of Ideal Basic Industries, which burned only 2,423 tons of coal in 1990, burned even less coal in 1991, 619 tons. However, with the increasing cost of natural gas during the second half of 1992, it is quite probable they will switch to coal. Should this take place, the Devil's Slide Plant could consume up to 40,000 tons of coal through the end of 1992.

Ashgrove Cement, formerly Southwest Portland Cement, purchased 94,000 tons of coal and burned 93,000 tons to produce 600,000 tons of cement during 1991, and is expected to do about the same in 1992. A number of lime and gypsum plants in the state used the remainder of the industrial coal in Utah.

In 1992, industrial coal consumption in Utah is expected to increase to 693,000 tons. Most of the increase can be attributed to the Devil's Slide Plant's switch from natural gas to coal during the second half of 1992.

Residential and commercial coal markets

Out-of-state markets

Coal consumption for residential and commercial purposes outside of Utah has been on the decline since the early '80s when consumption was about 300,000 tons per year. During the latter part of the '80s it declined to about 80,000 tons per year. In 1990, it stood at 59,000 tons, the lowest level for this consumption, but in 1991 it increased to 76,000 tons. Idaho and Washington are the major recipients of Utah coal for residential and commercial use. Colorado, Nevada and Oregon also receive small amounts (Appendix, Table 5). Consumption by the residential and commercial sectors in these states will probably increase in the near future.

Two elements affect out-of-state residential and commercial consumption. One is consideration for the environment and adherence to standards set by various air quality control agencies. The other is the cost of the fuel. During the last five years natural gas declined in price and became very competitive with coal on a cent-per-million-Btu-delivered basis. However, recent increases in the spot price of natural gas could provide an economic incentive for consumers to switch back to coal if local air quality regulations permit. Accordingly, Utah coal producers might see an increase in out-of-state consumption of Utah coal by residential and commercial markets. This is unlikely to be the case for consumption in Utah.

Utah markets

During 1991, residential and commercial consumption of coal in Utah decreased 16 percent to 320,000 tons, matching 1989 consumption.

In 1992, the out-of-state consumption will increase to 137,000 tons, but Utah consumption will decrease to 201,000 tons for a total of 338,000 tons.

Coal imports

Coal shipped to Utah from out-of-state decreased in 1991 compared to 1990. This was expected due to lower consumption of coal by the Deseret Generation and Transmission's Bonanza Plant, which imports its coal from Colorado. This plant purchased 1.31 million tons of coal from Colorado in 1991. In 1992, the Bonanza Plant is expected to increase purchases to 1.5 million tons.

Geneva Work's coal imports into Utah should decrease slightly from 695,000 tons in 1991 to 680,000 tons in 1992.

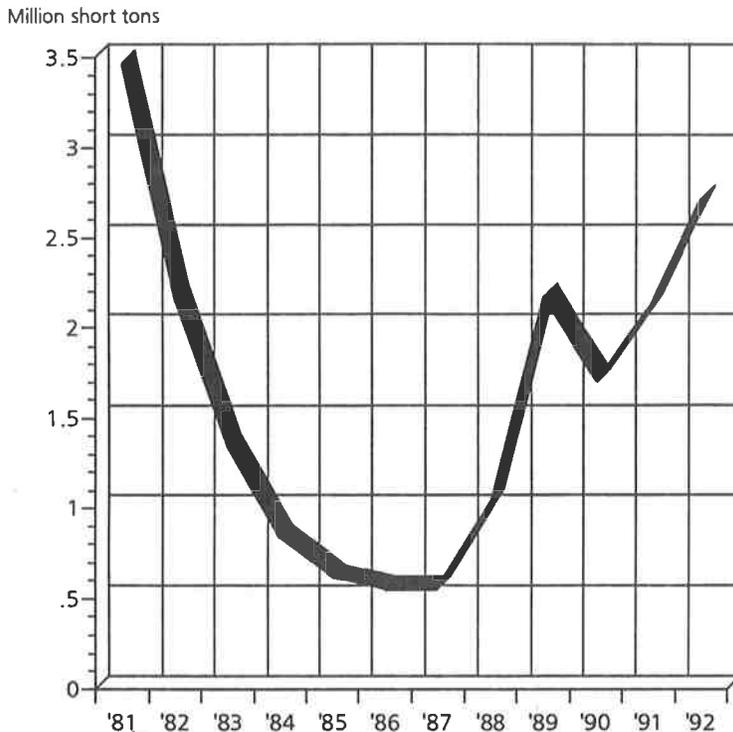
Ideal Basic Industries' Devil's Slide Plant purchased a little more than 2,000 tons of Wyoming coal for emergency use in 1991. Otherwise, it used natural gas throughout the year. In the second half of 1992, this plant could use as much as 40,000 tons of coal from Wyoming due to increased spot prices of natural gas.

There were no coal imports to the residential and commercial sector during 1991. There is no indication that any coal will be imported into Utah for use by this sector in 1992. Altogether, the imports of coal into Utah are expected to rise to 2.2 million tons in 1992.

Overseas exports

Utah coal exports to overseas markets during 1991 were quite im-

Utah coal exports to Pacific Rim countries



1992 value is forecast.

pressive, nearly matching the two highest export years during the past decade: 1982 — 2.18 million tons and 1989 — 2.18 million tons. (Appendix, Table 1)

The number of Utah coal companies exporting coal in 1991 remained at eight. Coal exports totaled 2.112 million tons in 1991 with shipments going to Utah's traditional Pacific Rim customers, Taiwan, Japan and Korea. In addition, a new Pacific Rim customer, China Light and Power of Hong Kong, purchased Utah coal in 1991.

Utah coal prices and production costs are still relatively low and should stay there for the foreseeable future — not even increasing at the rate of inflation.

The cost of loading coal onto ships could also go down, which would stimulate exports to this sector. At the Port of Los Angeles, unloading a unit train costs \$0.54

per ton of coal. Stockpiling costs \$0.68 per ton and reclaiming costs \$0.63 per ton. Actual loading of a ship costs \$2.93 per ton, with sampling, analysis and draft survey amounting to less than \$0.10 per ton. If all the coal is stockpiled first and loaded later it would cost \$4.88 to put one ton of coal onto a ship.

In most cases, good scheduling can result in 60 percent of the coal being loaded directly onto the ship with the other 40 percent coming from the stockpile, costing \$4.10 per ton for loading. If all the coal can be loaded directly, the cost may be as little as \$3.56.

The Port of Los Angeles, in conjunction with other investors (six U.S. coal producers, several Japanese coal traders including the Japan Coal Development Co. and a Korean entity), is embarking upon building a new loading and storage

facility. This dry bulk terminal should be completed by late 1995 or early 1996. Actual construction should start in early 1993. The loading capacity of the new facility would be more than twice the present facility, which is 15,000 metric tons (tonne) per day (mtpd). This should cut down the turnaround cost of a Panamax-size vessel (60,000 tons capacity) by two days, saving \$5,254 or about \$0.10 per tonne. The turnaround time of a Cape-size vessel (110,000 tons capacity) would be reduced by four days, saving \$19,896 or about \$0.18 per tonne. This facility would also reduce the turnaround time of the unit trains, resulting in further cost savings. In all, this facility will reduce the shipping, rail transportation, loading and stevedoring costs.

Exports are expected to increase from 2.1 million tons in 1991 and 2.7 million tons in 1992, to about 5 million tons per year toward the end of this decade.

One reason for this optimism is the increase in exports due to the improved competitive position of Utah coal with respect to our chief overseas competitor, Australia. Increased value of the Australian dollar and the increasing cost of coal production in that country should lead to greater demand for Utah coal among the Pacific Rim countries.

Another factor that may influence Utah coal exports is the consideration by the customers to purchase not only the cheapest coal but also coal that emits less noxious gaseous effluent and leaves more benign ash.

Coal operator and other company activities

Coastal States Energy Co.

Coastal continued to expand production capacity at its Skyline mines in 1991 with the addition of a second longwall. The longwall, installed in late summer, has a maximum mining height of almost 16 feet with a minimum of about 8 feet. The maximum mining height is greater than any other Western U.S. longwall. With this addition, Coastal expects to produce over 5.0 million tons at Skyline in 1992 with ultimate capacity of more than 6.0 million tons. Coastal's SUFCO mine continues to produce approximately 3.0 million tons per year with one longwall.

With implementation of the 1990 Amendments to the Clean Air Act, low-sulfur Western coal is expected to be in the spotlight as a cleaner fuel source for Midwestern utilities within the next few years. Somewhat surprisingly, several Midwestern utilities have already begun a testing process of Western U.S. coal, which has included Coastal's Utah coal. In recent months, Coastal has shipped coal to two of Illinois Power plants: Missouri Public Service, Springfield City Utilities; and Tampa Electric.

During 1992, Coastal is installing a tube conveyor at its Skyline mines. The conveyor will move the coal almost two-and-one-half miles from the mine to the rail loadout facility and will replace the trucks currently used for coal movement. The installation will cost several million dollars and take most of 1992 to complete, but it will provide an efficient and dependable method to move Skyline's coal to the rail.

Some of Coastal's 8.0 million tons of production during 1991 was shipped to the Pacific Rim, where low-sulfur, high-Btu coal is the product of choice. In recent months, Coastal's acquisition of Cravat Export Coal Sales, including its coal supply agreement with Taiwan Power, has been well publicized. While supply commitments will require much of the coal for that agreement to originate on the Gulf Coast, Coastal's Utah mines will also provide a significant quantity of coal to fulfill this agreement. Continued growth is expected in the Japanese market, especially with utility companies, and Coastal currently plans to participate in that growth.

Valley Camp of Utah Inc.

Valley Camp of Utah Inc., a subsidiary of the Quaker State Oil Co., laid off most of its miners as of July 1, 1992 and went on standby status with seven salaried workers and four union personnel. Valley Camp had not aggressively sought new contracts and was selling on the spot market, which became very inactive in recent months.

Mountain Coal Co.

Mountain Coal Co., which changed its name from Beaver Creek Coal Company last year, successfully installed its continuous haulage system in 1991 and increased its efficiency as well as its safety. Since the decline of the coal spot market in late 1991 and early 1992, Mountain Coal decided not to pursue that market and reduced its work force the past few months to serve its existing contracts more efficiently.

Sun Coal Co.

Sun Coal Co. decided to expand Soldier Creek Coal Co. operation in 1990 by installing a longwall machine but found it too costly (probably \$16 million) to do alone. Sun Coal tried to find a partner for the operation but was unsuccessful. Sun Coal then decided to sell Soldier Creek and take the tax write-off for its losses. Sun Coal did not accept the first bid for Soldier Creek received in 1991 and is contemplating a second bid from Pittsburgh & Midway Coal Co. (P&M).

Coal production activities were cut back from 138 employees in January 1992 to only 19 employees in March, working one shift and producing about 180,000 tons per year. During the second half of 1992, however, the rate of production showed marked improvement.

Andalex Resources Inc.

Andalex continues to be one of the more rapid-growing coal companies in central Utah. During 1991, it produced about 1.2 million tons of coal, all of which was shipped through the wildcat loadout facility located 22 miles southwest of the mine site. Production in 1992 should be about the same or slightly higher.

Andalex is currently mining from four distinct coal seams. The Apex mine is in the lower Sunnyside seam, the Pinnacle mine is in the Gilson and Centennial seams and the Aberdeen mine is in the Castle Gate A seam.

Andalex was issued a five-year permit renewal at its mine site in Central Utah in January of 1992.

The Smoky Hollow mine in Kaiparowits Plateau is on track. An Environmental Impact Statement (EIS) that was recently initiated will probably be prepared by ENSR of Colorado and completed by mid-1994.

Cyprus Plateau Coal Co.

With United States Fuel Coal Co. (U.S. Fuel) curtailing its operation and discontinuing its coal washing, the only company that remains as a source of natural fossil resin is Cyprus Plateau.

Cyprus Plateau has been quite active in production of coal for distribution within the United States and for export. Coal marketing executives from Australia, Taiwan, China, Korea and Japan visited the Cyprus Plateau Starpoint #2 mine in 1991.

United States Fuel Coal Co.

During 1991, U.S. Fuel continued operation at a reduced level, producing under a quarter of a million tons to fulfill its obligation on its only remaining contract. The spot market for Utah coal was rather quiet and U.S. Fuel did not aggressively pursue that market. During the first half of 1992, the condition remained similar to 1991 and very little change occurred in U.S. Fuel operations. U.S. Fuel began its reclamation work during 1992 by starting to dismantle its preparation plant, the first step toward complete shutdown.

Genwal Coal Co.

Genwal production was primarily from its state leases in Crandall Canyon during 1991. To get from its federal lease to its state leases Genwal had to go through a section of unleased federal land. An arrangement was made that provided for the production and sale of the coal by Genwal, with payment to the federal government of the difference between fair market

value (as determined by the Bureau of Land Management, who set it at the selling price of the coal) and the mining cost. A total of 269,000 tons of coal was produced from the unleased portion of the federal land. All the receipts went into the mineral lease fund, half of which goes to the state of Utah.

Genwal is also showing much interest in the export market and there is a good possibility that it will export in 1992.

Consolidation Coal Co.

Consolidation Coal Co. (Consol), the second largest coal producer in the country, has its main production in the eastern part of the country with major interests in the West. However, at the present time Powder River Basin (PRB) coal field in Wyoming is occupying more of Consol's time and capital expenditure than its Emery coal field in Utah.

Consol's reserves in Utah are quite good and within the near future may even become attractive again. However, since mid-1990, Consol's Emery mine has been idle and it is believed the mine will remain this way until either a new contract is negotiated or the spot market prices show enough strength to justify the resumption of operation.

Sunnyside Cogeneration Associates

In the summer of 1991, Sunnyside Cogeneration Associates (SCA), a wholly-owned subsidiary of Environmental Power Corp., began construction of its gross 58-MW waste coal-fired plant located in Sunnyside, Utah. SCA's facility will burn waste coal refuse deposited the last half century from the Sunnyside mine located adjacent to the SCA project. The waste coal refuse pile contains approximately 12.0 million tons of

waste material that is adequate for the 30-year operation of the plant. The current owner of the Sunnyside mine, Sunnyside Coal Co., may also add an additional 100,000 tons of waste coal refuse to this pile annually. SCA's project is anticipated to use approximately 400,000 tons of waste coal refuse annually.

SCA's facility will consist of a single circulating fluidized-bed boiler designed to burn waste coal containing as low as 3,500 Btu/lb. mean heating value. The mean heating value of the waste coal refuse is almost twice that amount. In addition, there is a single turbine/generator capable of accepting 500,000 pounds per hour of steam from the boiler at approximately 1,500 psig and 955 degrees. SCA's facility also includes a transmission line to the Utah Power grid at the Columbia Substation, which will purchase the electricity.

The design engineer for the project is Parsons Main Inc., who has contracted with TIC Construction Co. of Colorado to build the facility.

Enviro-Fuels Technology Inc.

In early 1992, Enviro-Fuels Technology Inc. started its sample briquetting operation in Price, Utah with a prototype production plant and a technology tested for combustibility, air pollutants, heat value and durability.

This small-scale operation will allow the company to fully understand and further develop the briquetting operation while producing a limited amount of coal briquet for residential consumption. This process could also be used to briquet coke breeze, which may be of interest to steel plants.

Savage Industries Inc.

Savage Industries Inc. is a Utah company headquartered in Salt

Coal leasing in Utah

Lake City. Savage and its affiliates transported over 8.5 million tons of Utah coal in 1991, serving eight different customers and delivering to three large power plants, two major industrial users and several loadout points. Savage also transported more than a half-a-million tons of coal from its Wasco Coal Terminal, located 25 miles northwest of Bakersfield, California, to cogeneration facilities in the area.

The Wasco Coal Terminal was built and is owned and operated by Savage Industries. The terminal meets all California environmental regulations and can handle up to 900,000 tons of coal annually.

During 1991, no federal coal leases were sold in Utah. However, work was continued in processing the following requests for Lease By Application (LBA).

On February 21, 1991, Sun Coal requested leases on the north side of its existing Soldier Creek Coal Co. mine to expand the operation into longwall. The leases were in Township 12S and Range 12E, Sections 31, 33 and 34, which is the Soldier Canyon tract. Priority was given to this LBA.

Draft of the Environmental Analysis (EA) was prepared, track delineation was made and the request was ready to go to the Regional Coal Team for approval. Spring of 1992 was tentatively set for the coal lease sale. In early 1992, Sage Point Coal Co. (official name for Soldier Creek Coal Co.) indicated that the LBA was going to be withdrawn and another one submitted for the Alkaly Creek Tract in T13S and R11E, Sections 1, 11, 12, 13, 14, 15, 23 and 24, as this was more suitable for continuous miner operation.

The LBAs for Crandall Canyon have been delineated. A study of geological and engineering information needs to be conducted. A company has been hired by the U.S. Forest Service to study the ground water and the total hydrology of the area. The Environmental Impact Statement for this LBA has yet to be initiated. The coal lease sale for this LBA would not occur before the spring of 1993.

Coastal States Energy filed an application on Jan. 10, 1991 for 2,020 acres in Winter Quarters, Carbon County in Township 13S and Range 6E, Sections 2, 3, 10 and 11. On Sept. 18, 1991 it received an exploration license for an additional 1,233 acres in the same area. The coal lease sale for this LBA could take place in mid-1993.

PacifiCorp (Utah Power) also submitted an LBA on Feb. 25, 1992 for 7,864 acres in Cottonwood Creek, Emery County in Township 17S and Range 6E in 20 of the 36 Sections. On July 3, 1991, it received an exploration license for 3,565 acres of the same LBA to gather more information. This LBA may go on sale in mid-1993.

Outlook for Utah's coal industry

Forecast for 1992

Prices

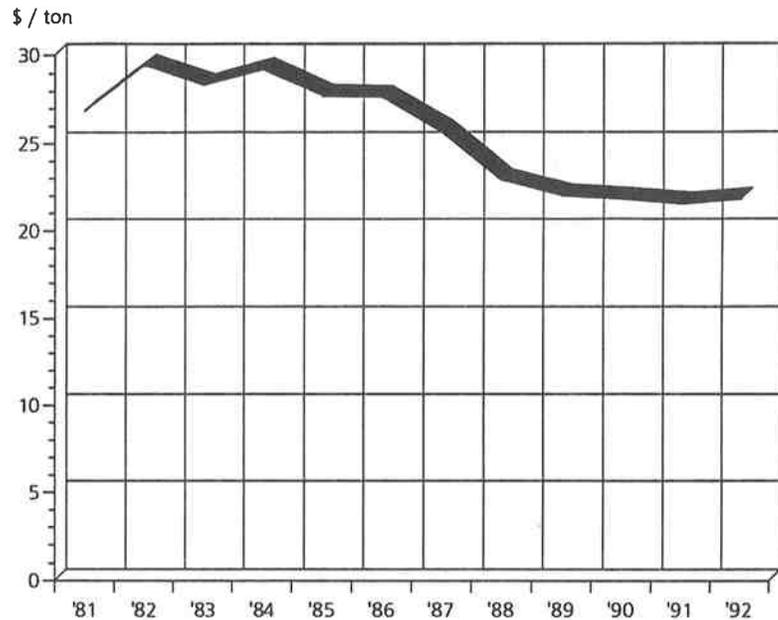
The decline in coal prices that started from the Utah coal price peak of \$29.42 per ton in 1982 is still in progress. Even though the rate of decline has slowed considerably, the decline continues. While the decline of prices in the mid-1980s was in the 7 to 10 percent range, it decreased to 1 percent in the 1990s.

One factor that influences the average selling price of coal is the spot market price. During the past few years the spot price of coal in Utah has fluctuated between \$16.00 and \$20.50 per ton. It was just over two years ago that we saw the upper end of the prices. Since then, the price of spot coal has plunged below previous lows.

The low price of natural gas and enforcement of the air quality regulations have had an impact on the amount of coal consumed along the Wasatch Front. However, IPP's lack of coal purchases on the spot market has had a greater impact.

Traditionally, IPP purchased 20 percent of its requirement, or about 1.0 million tons annually on the spot market. During 1991, IPP acquired 50 percent of Genwal Coal Co. from Nevada Power and made a commitment to purchase 0.3 million tons-plus annually from that company. At the same time, inexpensive hydropower from the Northwest became available and IPP reduced its burn in favor of purchasing that electricity. Concurrently, IPP decided to reduce its stockpile of coal at the plant

Utah coal prices



1992 value is forecast.

site. The cumulative effect of this action was to practically remove 1.0 million ton of spot coal demand against a 2.0 million-ton-plus supply on the market, leading to the breakdown of spot coal prices.

A turnaround in this trend and a firming up of Utah coal prices is expected. The forecast for the 1992 price is \$21.81 per short ton.

Production

Utah coal production in 1992 will be about 1.4 percent less than in 1991. This level of production for all practical purposes, is the same as 1990 and 1991. The small

amount of change in production can be explained by the desire to reduce stockpiles. On the optimistic side, coal production could increase by as much as 1.5 percent, pushing production to an all time high of 22.2 million tons.

Distribution

While production in 1992 could be less or greater than 1991 production by 1.4 percent or 1.5 percent respectively, change in the distribution of Utah coal in 1992 may be less than 1 percent from the 1991 figure. While the electric utility consumption of Utah coal

within the state may decrease slightly, the electric utility consumption outside of the state will increase. The consumption of coking coal could also increase slightly. The consumption of Utah industrial coal outside of the state will decrease by 10 percent and the consumption of industrial coal within the state will increase by 11 percent. The residential and commercial consumption of Utah coal outside the state will increase, while consumption by the same sector within the state will decrease. Finally, while coal imports to the state will go up by 0.2 million tons, exports to the Pacific Rim countries will increase by 0.6 million tons.

For the past seven years coal has accounted for a greater share of U.S. primary energy production. For the past 14 years the same has been true for Utah. In 1978, Utah produced 212.8 trillion Btu of coal and 207.4 trillion Btu of crude oil. Yellowcake production at the time stood at 142.6 trillion Btu. Since then, coal has been the major producer of energy in Utah.

By 1990, the ratio of coal to oil in terms of Btu was three to one. A reversal of proportion between the production ratio of these two primary energy sources is not expected. If anything, an increasing trend of coal production over crude oil production will continue for the foreseeable future.

The Western states' share of total U.S. coal production should remain stable at 40 percent and Utah's share of the U.S. production should increase slightly to the 2 percent level. This should amount to about 5 percent of the Western states' production.

Utah's increase in production will be impacted by two components. One will be the combined effect of population growth and energy efficiency in consumption,

which at times would result in a decrease rather than increase. The other will be exports to the Pacific Rim countries, which will increase even though it may fluctuate at times.

While the market for Utah coal is quite stable due to coal miner productivity and transportation tariffs, there are other variables that could affect total production in the future. The Clean Air Act Amendments of 1990 could have a substantial effect on Utah's coal production if transportation rates become more competitive. Decisions made by executives of the electric utility industry could, to a great extent, also affect Utah's coal production. However, those are very difficult decisions to make. Most states with high-sulfur coal try to protect their coal-mining jobs by giving financial incentives or mandating the use of locally produced coal. The constitutionality of either of these may be challenged by other states, as in the case of Wyoming, which challenged the Oklahoma law mandating the in-state use of a certain percentage of Oklahoma coal.

Other environmental protection regulations such as a carbon tax, although unlikely under present economic conditions, could adversely affect all coal production, including Utah's. On the other hand, the implementation of the presently experimental clean-coal technology could create renewed acceptability of coal. The cost reduction breakthrough that has been made in the production of the coal-based synthetic fuels could to some extent favorably affect U.S. coal production and to a greater extent Utah coal production. However, optimism for coal-based liquid fuel becoming economically viable is rather premature. As the production cost of coal-based liquid fuels ap-

proaches the price of its competitor — crude oil — the Organization of Petroleum Exporting Countries (OPEC) would probably, if not assuredly, lower the price of its crude oil to protect its share of the liquid fuel energy market. As new technologies develop in coal production, capitalization costs will increase, while the labor costs will decrease resulting in a total cost reduction. This would enhance the viability of Utah coal mining job survival, but not without some job losses.

Appendix

- Table 1 Historical production, distribution and consumption of coal in Utah**
- Table 2 Utah coal production by coal field**
- Table 3 Utah coal production by county**
- Table 4 Utah coal production by landownership**
- Table 5 1991 distribution of Utah coal**

Table 1 Historical production, distribution and consumption of coal in Utah

Thousand short tons (where applicable)

No.	Category	Year											
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
1	Production	13,808	16,912	11,829	12,259	12,831	14,269	16,521	18,164	20,517	22,012	21,875	21,521
2	Distribution	14,627	15,397	12,188	12,074	14,361	13,243	16,989	18,244	21,289	21,680	21,673	21,506
3	E U outside Utah	2,688	3,643	3,404	3,730	3,746	2,989	3,182	2,797	2,623	3,373	3,608	3,707
4	E U in Utah	4,837	6,153	5,220	4,912	7,385	7,614	11,677	12,533	12,963	14,053	13,472	12,988
5	C P outside Utah	779	859	0	0	0	0	0	0	0	0	0	0
6	C P in Utah	1,297	831	886	1,392	1,328	868	291	1,259	1,277	1,296	1,310	1,335
7	Ind outside Utah	1,645	1,349	1,091	1,542	1,866	1,745	1,813	1,996	2,401	2,327	2,158	1,939
8	Ind in Utah	591	812	664	551	450	374	349	739	810	619	624	693
9	R/C outside Utah	180	233	292	311	312	81	83	88	84	59	76	137
10	R/C in Utah	197	177	191	258	252	191	204	236	323	382	320	201
11	Exports	3,472	2,177	1,346	849	625	551	555	1,044	2,175	1,708	2,112	2,726
12	Total imports	1,136	797	937	1,539	1,580	1,145	1,165	2,448	2,367	2,137	2,007	2,220
13	Imports for E U	8	18	0	224	193	659	905	1,300	1,400	1,449	1,310	1,500
14	Imports for C P	1,030	695	854	1,229	1,289	383	160	1,088	922	679	695	680
15	Imports for Ind	98	84	83	85	98	103	100	60	45	7	2	40
16	Imports for R/C	0	0	0	1	0	0	0	0	0	2	0	0
17	Coal operators	16	16	15	15	15	16	16	14	14	13	12	12
18	Active mines	28	29	25	24	22	21	20	17	20	18	16	16
19	Employees	4,166	4,296	2,707	2,525	2,563	2,881	2,650	2,559	2,471	2,791	2,292	2,216
20	Productivity (ton/mth)	1.99	2.05	2.59	2.94	2.8	3.08	3.25	3.69	4.42	4.22	5.55	5.64
21	Avg. price (\$/ton)	26.87	29.42	28.32	29.2	27.69	27.64	25.67	22.85	22.01	21.78	21.56	21.81
22	Total value (\$million)	371	498	335	358	355	394	417	415	451	479	472	469

Values for 1992 are forecast. All distributions include imports.

E U = Electric Utilities C P = Coke Plants Ind = Industry R/C = Residential and Commercial

Table 2 Utah coal production by coal field
 Thousand short tons

Year	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
Cumulative Production	303,237	261,013	9,545	2,654	4,330	2,332	583,111

Table 3 **Utah coal production by county**
 Thousand short tons

Year	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	1	0	4,635
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	10,022	9,103	2,887	0	0	0	0	22,012
1991	10,026	8,770	3,079	0	0	0	0	21,875
Cumulative Production	367,599	166,699	40,750	4,272	821	69	2,901	583,111

Table 4 **Utah coal production by landownership**
 Thousand short tons

Year	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

Table 5 **1991 distribution of Utah coal by destination and end-use**
 Thousand short tons

Destination	Electric utilities	Coke plants	Other industrial	Residential & commercial	Total
Arizona	1	0	110	0	111
California	1,066	0	1,566	0	2,632
Colorado	0	0	0	2	2
Idaho	0	0	21	55	76
Illinois	10	0	0	0	10
Iowa	0	0	0	*	*
Montana	0	0	50	0	50
Nevada	2,531	0	178	2	2,711
Utah	12,162	615	622	320	13,719
Oregon	0	0	1	1	2
Washington	0	0	170	16	186
Wyoming	0	0	62	0	62
Pacific Rim	2,112	0	0	0	2,112
Total	17,882	615	2,780	396	21,673

* Amount less than 500 tons.