

Annual Review and Forecast of
UTAH COAL
Production and Distribution – 2005



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Cover photographs by Michael Vanden Berg:

Clockwise from left:
PacifiCorp's Huntington coal-burning power plant,
SUFCO mine loadout, coal storage pile at the West Ridge mine



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PREFACE

This report was prepared by Michael Vanden Berg under the direction of David Tabet, Energy and Minerals Program Manager, and Richard Allis, Director of the Utah Geological Survey, Utah Department of Natural Resources. Specific information about the data in this report can be obtained from Michael Vanden Berg at 801-538-5419, or email at michaelvandenber@utah.gov.

The annual Utah Coal Report was previously prepared by the Department of Natural Resources' Utah Energy Office; however, with the elimination of the Energy Office in the spring of 2005, the responsibility for the Utah Coal Report has shifted to the Utah Geological Survey. As in previous years, data for the report were gathered directly from coal producers and consumers, and comparisons were made to national data, news and company reports, and industry experts.

For more information on Utah coal or other energy-related data, please refer to the "Utah Energy and Mineral Statistics" web-based data repository located at <http://geology.utah.gov/sep/energydata>.

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EXECUTIVE SUMMARY

Utah coal production in 2005 increased by 12.6% to 24.6 million short tons after experiencing a 10-year production low in 2004. This significant increase was the result of a full year's worth of production at the recently reopened Emery mine, new longwall production in the Mill Fork tract at Deer Creek, higher mining productivity resulting from improved geologic conditions at Dugout Canyon, and increased production due to retreat mining at Crandall Canyon. With more Utah coal available, distribution increased 8.5% to 24.5 million short tons, and out-of-state coal imports dropped from an all-time high of 3.2 million short tons in 2004 to 2.8 million short tons in 2005. To support these growing production rates, Utah coal operators hired 280 new employees for a total active mine workforce of 1803, the highest since 1999. Furthermore, the average price of Utah coal increased in 2005 by 9.3% to \$19.34 per short ton, the highest price in nominal dollars recorded in the past 10 years.

Utah's coal industry will continue to be strong in 2006, with production expected to total 26.7 million short tons and increasing even further in 2007 to 29.3 million short tons, which would set a new state production record. This continued increase will mostly be the result of renewed longwall production at the reopened Skyline mine, higher production at SUFCO and Dugout, as well as high retreat production at Crandall Canyon. Coal-related employment in 2006 is projected to increase by 194 individuals and total 1997 employees. The average price of Utah coal is expected to dramatically increase by 16.0% to \$22.44 per short ton, the highest price in nominal dollars since 1988. Overall Utah coal distribution should increase to 26.2 million short tons, while imports are expected to decrease to 2.3 million short tons.

Three newly proposed coal mines are in various stages of the permitting process: the Lila Canyon and Razor mines, both located in the southern Book Cliffs coal field, and the Alton mine located in the Alton coal field in southern Utah's Kane County. As electricity consumption continues to increase, and with 1200 MW of new Utah coal-fired electric capacity in the planning process, these new mines, along with increased productivity at existing mines, will be needed to meet consumer demands.

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UTAH COAL PRICES, EMPLOYMENT, AND PRODUCTION

The U.S. Energy Information Administration (EIA) indicates that U.S. coal production in 2005 increased by 1.9% to 1133.3 million short tons (table 1). This is the second straight year of increased production after significant declines from 2001-2003. This continued upward trend was the result of 16 out of 26 states, including the top six producers, increasing their production in 2005. Western states, which account for 51.8% of the U.S. total, increased their production by 2.0%, while the Interior and Appalachian regions increased their production by 2.1% and 1.7%, respectively.

Utah's coal production dramatically increased from 21.8 million short tons in 2004 to 24.6 million short tons in 2005. This increase of 12.6%, the largest increase for any state producing more than 200,000 short tons a year, ranks Utah as the 14th highest coal producing state, one higher than last year. Despite this big single-year increase, the largest since 1989, Utah's 2005 coal production was still 9.3% lower than the peak-year production of 27.1 million short tons in 1996. However, projections for 2006 indicate an 8.8% increase in coal production to 26.7 million short tons. This increase assumes that the Skyline mine, which was closed for parts of 2004 and 2005, will continue to ramp up production throughout 2006. Operator projections for 2007 are even more impressive, totaling 29.3 million short tons, which would be more coal produced than in any previous year. While this estimate is speculative, it is not unreasonable, especially if the Skyline mine commences longwall operation and the Crandall Canyon mines boost their production during retreat mining. This figure becomes even more realistic if the proposed Lila Canyon mine begins operation in 2007.

Prices and Revenue

The average Free on Board (FOB) price for Utah coal increased 9.3% in 2005 from \$17.70 per short ton in 2004 to \$19.34, the highest price since 1994 (table 2). As recently as 2003, the average Utah coal price was at a 30-year low of \$16.64 per short ton. Not many Utah mines can take advan-

Table 1. U.S. Coal Production by State, 2004-2005.

Thousand short tons				
2005 Rank	State	2004	2005	Percent Change
1	Wyoming	396,493	406,364	2.5%
2	West Virginia	147,993	153,560	3.8%
3	Kentucky	114,244	119,828	4.9%
4	Pennsylvania	65,996	67,264	1.9%
5	Texas	45,863	45,939	0.2%
6	Montana	39,989	40,354	0.9%
7	Colorado	39,870	38,510	-3.4%
8	Indiana	35,110	34,442	-1.9%
9	Illinois	31,859	32,056	0.6%
10	North Dakota	29,943	29,956	0.0%
11	New Mexico	27,250	28,519	4.7%
12	Virginia	31,420	27,743	-11.7%
13	Ohio	23,222	24,666	6.2%
14	Utah	21,818	24,556	12.6%
15	Alabama	22,271	21,339	-4.2%
16	Arizona	12,731	12,072	-5.2%
17	Washington	5,653	5,266	-6.8%
18	Maryland	5,225	5,183	-0.8%
19	Louisiana	3,805	4,161	9.4%
20	Mississippi	3,586	3,555	-0.9%
21	Tennessee	2,887	3,217	11.4%
22	Oklahoma	1,792	1,844	2.9%
23	Alaska	1,512	1,454	-3.8%
24	Missouri	578	598	3.5%
25	Kansas	71	171	140.8%
26	Arkansas	7	3	-57.1%
	Refuse Recovery	984	670	-31.9%
	Appalachian	389,884	396,390	1.7%
	Interior	146,044	149,177	2.1%
	Western	575,259	587,051	2.0%
	East of Mississippi R.	483,812	492,853	1.9%
	West of Mississippi R.	627,375	639,767	2.0%
	U.S. Total	1,112,172	1,133,290	1.9%

Source: U.S. Energy Information Administration, U.S. Supply and Demand: 2005 Review; Utah production from UGS coal company questionnaires

tage of the present high spot price recorded for Utah coal, currently at about \$37.00 per short ton, because their production is mostly committed to lower-priced contracts, thus reducing the overall average FOB mine price. While demand

for coal increases, prices for other fuels remain high, older lower-priced contracts expire, and mining becomes more difficult, coal prices should continue to increase. The average FOB price for 2006 is projected to increase by 16.0% to \$22.44 per short ton, the highest price since 1988, but still well below the inflation-adjusted price of \$80.44 per short ton reached in 1976.

Revenues from coal produced in Utah increased substan-

tially in 2005 because of the large increases in price and production. Revenues reached an estimated \$474.9 million in 2005, 23.0% higher than in 2004. Similar increases in production and prices are expected in 2006, pushing the estimated revenue up an additional 26.2% to \$599.5 million, the highest amount ever recorded in nominal dollars, but a little less than half the highest inflation-adjusted price of \$1029.1 million reached in 1982.

Table 2. Utah Coal Industry Production, Employment, Productivity, Prices and Revenue, 1960-2006.

Year	Production Thousand short tons	# of operators	# of mines	Employment ¹	Productivity ²	Average FOB Price		Revenue	
				# of employees	Tons/employee hour	\$/Ton (nominal dollars)	\$/Ton (real 2006 dollars)	Million \$ (nominal dollars)	Million \$ (real 2006 dollars)
1960	4,955	na	45	2,418	na	6.35	42.82	31.5	212.2
1961	5,159	na	50	2,206	na	6.03	40.25	31.1	207.7
1962	4,297	na	38	2,034	na	5.40	35.69	23.2	153.4
1963	4,359	na	36	1,596	na	5.22	34.05	22.8	148.4
1964	4,720	na	35	1,679	na	7.03	45.26	33.2	213.6
1965	4,992	na	31	1,495	na	6.37	40.36	31.8	201.5
1966	4,636	na	25	1,374	na	5.77	35.55	26.7	164.8
1967	4,174	na	24	1,238	na	5.82	34.78	24.3	145.2
1968	4,317	na	23	1,155	na	5.77	33.09	24.9	142.9
1969	4,657	na	21	1,193	na	6.31	34.32	29.4	159.8
1970	4,733	na	20	1,469	na	7.28	37.45	34.5	177.3
1971	4,626	na	22	1,430	na	7.37	36.32	34.1	168.0
1972	4,802	na	22	1,582	na	8.93	42.64	42.9	204.8
1973	5,650	na	16	1,603	na	11.19	50.30	63.2	284.2
1974	6,046	na	15	1,514	na	12.24	49.56	74.0	299.6
1975	6,937	na	20	2,550	na	19.84	73.61	137.6	510.6
1976	7,968	na	24	2,614	na	22.93	80.44	182.7	640.9
1977	8,838	na	26	2,703	na	20.32	66.93	179.6	591.5
1978	9,253	na	28	3,424	na	21.52	65.88	199.1	609.6
1979	12,096	na	25	3,656	na	22.71	62.44	274.7	755.2
1980	13,236	na	29	3,512	na	25.63	62.08	339.2	821.7
1981	13,808	16	28	4,166	1.99	26.87	59.00	371.0	814.7
1982	16,912	16	29	4,296	2.05	29.42	60.85	497.6	1,029.1
1983	11,829	15	25	2,707	2.41	28.32	56.75	335.0	671.3
1984	12,259	15	24	2,525	2.97	29.20	56.10	358.0	687.7
1985	12,831	15	22	2,563	2.73	27.69	51.37	355.3	659.1
1986	14,269	16	21	2,881	3.01	27.64	50.34	394.4	718.3
1987	16,521	16	20	2,650	3.49	25.67	45.10	424.1	745.2
1988	18,164	14	17	2,559	3.77	22.85	38.55	415.0	700.3
1989	20,517	14	20	2,471	4.03	22.01	35.43	451.6	726.9
1990	22,012	13	18	2,791	4.17	21.78	33.26	479.4	732.2
1991	21,875	11	16	2,292	4.71	21.56	31.60	471.6	691.2
1992	21,015	10	16	2,106	4.78	21.83	31.06	458.8	652.7
1993	21,723	9	15	2,161	5.36	21.17	29.24	459.9	635.2
1994	24,422	8	14	2,024	5.64	20.07	27.03	490.1	660.1
1995	25,051	7	14	1,989	6.18	19.11	25.03	478.7	627.0
1996	27,071	7	13	2,077	6.47	18.50	23.53	500.8	637.1
1997	26,428	8	16	2,091	5.51	18.34	22.81	484.7	602.8
1998	26,600	8	17	1,950	6.60	17.83	21.83	474.3	580.8
1999	26,491	8	15	1,843	5.40	17.36	20.80	459.9	551.0
2000	26,920	8	13	1,672	6.84	16.93	19.62	455.8	528.3
2001	27,024	7	13	1,564	9.42	17.76	20.02	479.9	540.9
2002	25,299	8	13	1,525	6.22	18.47	20.49	467.3	518.4
2003	23,069	9	14	1,583	5.80	16.64	18.05	383.9	416.4
2004	21,818	8	13	1,523	5.69	17.70	18.70	386.2	408.1
2005	24,556	8	13	1,803	5.15	19.34	19.77	474.9	485.4
2006*	26,715	8	13	1,997	6.72	22.44	22.44	599.5	599.5

Source: UGS coal company questionnaires

¹Includes only active Utah coal mines and their associated operations

²1983-2004 data have been revised

*Forecast

Employment

During 2005, the number of active mines remained steady at 13, but the number of employees at these mines increased substantially from 1523 to 1803 (table 2). The largest employment increase occurred at the Skyline mine, which after shutting down briefly in 2004, reopened in 2005, and is in the process of longwall development work. The Cop mine also hired many new employees in 2005 resulting in increased production. In fact, all Utah mines either increased or maintained the same number of employees as 2004. Active-mine related employment totals are projected to increase by an additional 194 individuals in 2006 as demand for higher production continues. Employment totals could increase by another 200 to 300 people in 2007 and 2008 if the proposed Lila Canyon mine starts production.

Coal Mining Productivity

Production efficiency at Utah coal mines declined slightly during 2005, from 5.69 short tons of coal produced per employee per hour in 2004 to 5.15 tons per employee hour in 2005 (table 2). Even though there was a large increase in production between 2004 and 2005, employment also rose, essentially offsetting any potential gains in productivity. Utah's 2005 productivity is significantly lower than the 8.25 tons per employee hour recorded by EIA's Annual Coal

Report for underground mines in western U.S. states during 2004. On average, each employee produced 13,600 tons during 2005, down from 14,300 tons in 2004, but still higher than the 1990's average of 11,600 tons per employee and much higher than the 1980's average of 5,300 tons per employee. Mining productivity projections for 2006 suggest a significant increase to 6.72 short tons per employee per hour due to increased production from longwall operations.

Production by Coal Field

Mines in the Wasatch Plateau coal field accounted for 58.8% of Utah's coal production in 2005, down slightly from 60.0% the year before. The Skyline mine reopened in 2005, but produced only 405,000 short tons as redevelopment work commenced. Skyline's low production was offset by large production increases at the Crandall Canyon (86.5%), Bear Canyon (34.4%), and Deer Creek (16.5%) mines. Production at the other two mines located within the Wasatch Plateau, the SUFCO and Horizon mines, stayed about the same between 2004 and 2005.

The Book Cliffs coal field accounted for 36.4% of total production in 2005, the second highest behind 2004's share of 38.9% (table 3). Overall production from mines in the Book Cliffs increased by 5.3% in 2005 to an all-time high of 8.9 million short tons and production from this field is predicted to increase by an additional 6.4% in 2006. The ANDALEX Tower Division, which operates the Aberdeen

Table 3. Coal Production in Utah by Coal Field, 1982-2006.

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	3,095	416,685
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	24,422
1995	22,631	2,420	0	0	0	0	25,051
1996	23,616	3,455	0	0	0	0	27,071
1997	22,916	3,512	0	0	0	0	26,428
1998	22,708	3,892	0	0	0	0	26,600
1999	23,572	2,919	0	0	0	0	26,491
2000	22,967	3,953	0	0	0	0	26,920
2001	21,919	5,106	0	0	0	0	27,024
2002	19,654	5,619	26	0	0	0	25,299
2003	15,868	6,958	243	0	0	0	23,069
2004	13,082	8,479	256	0	0	0	21,818
2005	14,442	8,927	1,187	0	0	0	24,556
2006*	15,912	9,503	1,300	0	0	0	26,715
Cumulative Production	586,721	323,304	11,257	2,654	4,330	3,095	931,361

Source: UGS coal company questionnaires

*Forecast, 2006 numbers not included in totals

and Pinnacle mines, experienced mining difficulties in 2005, which lowered their production from 2.4 million short tons in 2004 to 1.7 million short tons in 2005 (table 4). Canyon Fuel's Dugout mine offset ANDALEX's losses by increasing their production from 3.8 million short tons in 2004 to 4.6 million short tons in 2005. The West Ridge mine also increased production in 2005 by 362,000 short tons to 2.6 million short tons. Book Cliffs coal field production could become even more significant in the future with the proposed opening of the Lila Canyon mine.

Coal production resumed in the Emery coal field in 2002 with the reopening of the Emery mine. This mine produced 243,000 short tons in 2003 before closing again in August of that year due to contract and ownership issues. The Emery mine reopened in August of 2004, producing 256,000 short tons before the year was finished. Mining was continuous throughout 2005 with total production equaling 1.2 million short tons.

The remainder of Utah's coal fields are inactive, as they have been for many years (table 3). Several fields, such as the Kaiparowits Plateau, which holds an estimated 9.1 billion tons of recoverable coal, cannot be mined because of land-use restrictions and/or the fields are too remote for econom-

ical transport to market (see appendix table A5). However, a new surface mine is being proposed in the Alton coal field in southern Utah. This mine has the potential to produce up to 2.0 million short tons of coal a year.

Production by County

With the increased production at the Bear Canyon, Crandall Canyon, and Deer Creek mines, the three producing counties in Utah all shared relatively the same percentage of total Utah coal production. The mines in Emery County increased production to 7.4 million short tons in 2005, 30.0% of Utah's total, compared to only producing 5.5 million short tons in 2004, but still well below the peak annual production of 17.3 million tons produced in 1995 (table 5). Emery County could see a significant resurgence in coal production if the proposed Lila Canyon mine begins operation. Carbon County mines produced the majority of coal in 2005 at 9.6 million short tons, 39.2% of Utah's total, up from 8.7 million short tons in 2004. As of 2005, all new production at the Skyline mine will be in their northern leases located in Carbon County, as opposed to previous mining that occurred in

Table 4. Coal Production and Recoverable Reserves in Utah by Coal Mine, 2001-2006.

Thousand short tons

Company	Mine	County	Coal Field	2001	2002	2003	2004	2005	2006*	Estimated Recoverable Reserves Currently Under Lease
ANDALEX Resources, Inc. (Tower Division)	Aberdeen	Carbon	Book Cliffs	531	37	444	1,984	1,519	2,313 ¹	11,000 ¹
	Pinnacle	Carbon	Book Cliffs	296	662	584	419	189		
Canyon Fuel, LLC	Dugout Canyon	Carbon	Book Cliffs	1,981	2,080	2,941	3,811	4,592	4,559	38,000
	Skyline #3	Emery/Carbon	Wasatch Plateau	3,822	3,477	2,771	551	405	1,418	16,000
	SUFCO	Sevier	Wasatch Plateau	7,001	7,600	7,126	7,568	7,567	7,774	74,500
Consolidation Coal Co.	Emery	Emery	Emery	--	26	243	256	1,187	1,300	40,000
C.W. (Co-op) Mining Co.	Bear Canyon #3	Emery	Wasatch Plateau	--	4	310	227	304	800 ¹	23,600 ¹
	Bear Canyon #4	Emery	Wasatch Plateau	--	--	--	112	151		
	Bear Canyon #1	Emery	Wasatch Plateau	1,254	953	403	--	--	--	
Energy West Mining Co.	Deer Creek	Emery	Wasatch Plateau	4,338	3,984	3,938	3,356	3,910	3,900	53,000
	Trail Mountain	Emery	Wasatch Plateau	924	--	--	--	--	--	--
GENWAL Resources, Inc.	Crandall Canyon	Emery	Wasatch Plateau	3,996	3,248	1,161	872	1,593	1,720 ¹	13,000 ¹
	South Crandall Canyon	Emery	Wasatch Plateau	--	--	26	103	225		
Hidden Splendor Resources, Inc.	Horizon ²	Carbon	Wasatch Plateau	23	110	108	293	286	300	5,000
Lodestar Energy, Inc.	Whisky Creek #1	Carbon	Wasatch Plateau	--	278	25	--	--	--	--
	White Oak #2	Carbon	Wasatch Plateau	560	--	--	--	--	--	--
WEST RIDGE Resources, Inc.	West Ridge	Carbon	Book Cliffs	2,298	2,840	2,989	2,265	2,627	2,631	37,000
Total				27,024	25,299	23,069	21,818	24,556	26,715	311,100

Source: UGS coal company questionnaires

¹Combined total for entire operation

²Owned by Lodestar in 2001

*Forecast

Table 5. Coal Production in Utah by County, 1960-2006.

Thousand short tons								
Year	Carbon	Emery	Sevier	Summit	Iron	Kane	Others	Total
1870-1959	211,028	49,166	4,046	4,012	521	45	3,608	272,426
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	5,985	16,872	4,214	0	0	0	0	27,071
1997	6,956	14,533	4,939	0	0	0	0	26,428
1998	7,206	13,675	5,719	0	0	0	0	26,600
1999	4,514	16,214	5,763	0	0	0	0	26,491
2000	4,615	16,399	5,906	0	0	0	0	26,920
2001	5,689	14,334	7,001	0	0	0	0	27,024
2002	6,007	11,692	7,600	0	0	0	0	25,299
2003	7,091	8,852	7,126	0	0	0	0	23,069
2004	8,772	5,477	7,568	0	0	0	0	21,818
2005	9,618	7,372	7,567	0	0	0	0	24,556
2006*	11,221	7,720	7,774	0	0	0	0	26,715
Cumulative Production	442,982	361,792	117,761	4,272	821	70	3,663	931,361

Source: UGS coal company questionnaires

*Forecast, 2006 numbers not included in totals

Emery County. Sevier County's only active mine, SUFCO, maintained its production of 7.6 million short tons in 2005, 30.8% of Utah's total.

Production by Landownership

Federal leases continued to dominate Utah's production picture as mines on U.S. Bureau of Land Management (BLM) and Forest Service land accounted for 19.6 million tons, or 79.8%, of the state's total coal production in 2005 (table 6). However, this is much less than the 2004 federal

share of 92.9% and this percentage is expected to once again decrease to 67.1% in 2006. This decline is the result of many operators moving production to state leases.

Lands owned by the State of Utah supplied 2.7 million short tons of coal in 2005, which is more than triple the 2004 production of 849,000 short tons. State lands accounted for 10.9% of total state production in 2005, up from 3.9% in 2004. This increase was the result of Deer Creek moving into the state-owned Mill Fork tract in June of 2005, as well as significant state production at the Crandall Canyon mines. Production on state lands is again expected to significantly

Table 6. Coal Production in Utah by Landownership, 1980-2006.

Thousand short tons

Year	Federal Land	% of Total	State Land	% of Total	County Land	% of Total	Fee Land	% of Total	Total
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	25,996	96.0%	446	1.6%	15	0.1%	614	2.3%	27,071
1997	25,161	95.2%	339	1.3%	0	0.0%	928	3.5%	26,428
1998	24,954	93.8%	297	1.1%	37	0.1%	1,312	4.9%	26,600
1999	21,982	83.0%	3,071	11.6%	65	0.2%	1,373	5.2%	26,491
2000	20,812	77.3%	4,021	14.9%	0	0.0%	2,087	7.8%	26,920
2001	18,369	68.0%	5,386	19.9%	331	1.2%	2,939	10.9%	27,024
2002	18,365	72.6%	4,353	17.2%	278	1.1%	2,303	9.1%	25,299
2003	18,815	81.6%	2,192	9.5%	25	0.1%	2,037	8.8%	23,069
2004	20,268	92.9%	849	3.9%	0	0.0%	701	3.2%	21,818
2005	19,602	79.8%	2,665	10.9%	6	0.0%	2,283	9.3%	24,556
2006*	17,925	67.1%	6,418	24.0%	22	0.1%	2,350	8.8%	26,715

Source: UGS coal company questionnaires

*Forecast

increase in 2006 to about 6.4 million short tons, or 24.0% of the state's total, and continue this upward trend into 2007 and beyond as the Dugout Canyon and SUFCO mines enter large state-owned leases.

Production on private "fee" land increased from 701,000 short tons in 2004 to 2.3 million short tons in 2005, 9.3% of Utah's total. The majority of fee coal in 2005 came from the Emery mine and the ANDALEX Tower division, with lesser amounts from the Crandall Canyon, Horizon, West Ridge, and Bear Canyon mines. Coal produced on private land should increase slightly to 2.4 million short tons in 2006 as the Emery and ANDALEX mines continue strong production.

A small amount of county coal, about 6,000 short tons, was produced at the Skyline mine in 2005 and is expected to increase slightly to 22,000 short tons in 2006. Peak county coal production occurred in 1990 with 606,000 short tons being produced, while 278,000 short tons were produced as recently as 2002.

Production by Mining Method

During 2005, six longwall mining machines produced 18.1 million short tons of coal, accounting for 73.8% of total Utah production. Most notably, a new low-profile longwall machine, which can cut coal in a seam only 5.2 feet thick, was installed at the Crandall Canyon mine in 2004. A seventh longwall machine, located at the reopened Skyline mine, is currently being reconditioned for future use. The remaining 26.2% of state coal production came from 24 continuous miner machines.

The processing of waste coal piles at the closed Sunnyside and Star Point mines is not generally considered coal mining, but rather reclamation activity. Fluidized-bed combustion technology allows discarded wash plant waste and other coal refuse to be used as fuel at Utah's Sunnyside Cogeneration power plant. Annual waste coal consumption at the Sunnyside Cogeneration facility averages roughly 450,000 short tons.

ACTIVITIES OF UTAH COAL OPERATORS

Utah coal production rose 12.6% in 2005 to 24.6 million short tons. This resurgence was mainly fostered by hefty production increases at the Emery (363.7%), Crandall and South Crandall Canyon (86.5%), Bear Canyon (34.4%), Dugout Canyon (20.5%), Deer Creek (16.5%), and West Ridge (16.0%) mines. Also in 2005, the temporarily closed Skyline mine returned to production, even though full capacity will not be achieved until 2007. This significant increase in Utah coal production eased worries of supply shortages created by the 10-year production low of 2004.

Utah's coal picture for 2006 looks even brighter. Coal production is expected to increase again to 26.7 million short tons, based mostly on Skyline's start-up of longwall production. Prices are expected to continue to climb and operators plan to hire an additional 194 employees. Predictions for 2007 are even more optimistic; operators are suggesting a statewide production total of 29.3 million short tons, which would establish a new single-year record.

Utah coal companies report their operations are faced with the soaring costs of fuel, steel, rubber, and general labor. As the cost of mining increases, so does the cost of Utah coal, making it more difficult to compete with cheaper coal from Wyoming and Colorado. Many Utah operators also report that difficult geologic conditions are resulting in a higher-ash product. Two new coal cleaning facilities, the Wellington Cleaning Facility and the Castle Valley Coal Preparation Plant, both located near the Savage Coal Terminal, will help mitigate coal quality problems.

Three proposed coal mines are in different stages of the permitting process, two in the Book Cliffs coal field of central Utah and one in the Alton coal field of southern Utah. These proposed mines may be positioning themselves to meet a surge in coal demand when a third unit is built at the Intermountain Power Project. This new unit could burn up to 3.0 million short tons of coal a year. Also, Nevco Energy's proposed circulating fluidized-bed coal-fired power plant near Sigurd, Utah would add 1.0 million short tons of new demand if plans are approved and the plant is built.

ANDALEX Resources, Inc.

ANDALEX Resources, Inc. currently has three divisions located in Utah: the Centennial or Tower Division, consisting of the Aberdeen and Pinnacle mines; GENWAL Resources, Inc., which manages the Crandall Canyon and South Crandall Canyon mines; and WEST RIDGE Resources, Inc., which manages the West Ridge mine. ANDALEX wholly owns the Tower Division, whereas the two other divisions are half-owned by Intermountain Power Agency (IPA). IPA owns and operates the Intermountain Power Project near Delta, which is the largest single coal consumer in the state. The Wildcat railroad loadout, an ANDALEX facility in Carbon County, serves all three ANDALEX mining divisions. In the fall of 2005, ANDALEX Resources, Inc. announced their intentions to sell their coal assets in Utah.

Update (as of August 9, 2006): The Murray Energy Corporation, the largest independent, family-owned coal producer in the United States, has acquired ANDALEX Resources and its four subsidiary companies; the Tower, GENWAL, and WEST RIDGE mines, as well as the Wildcat Loadout. UtahAmerican Energy, a Murray Energy subsidiary, will own and operate the ANDALEX facilities; GENWAL and WEST RIDGE will continue to be half owned by IPA. UtahAmerican Energy also owns the reserves at the proposed Lila Canyon mine in the Emery County portion of the Book Cliffs coal field.

Tower Division – Aberdeen and Pinnacle Mines

The Tower Division is located in Deadman Canyon about 7 miles north of Price. Combined production from both the Aberdeen and Pinnacle mines totaled 1.7 million short tons in 2005, a significant decrease from the 2.4 million short tons produced in 2004, but much higher than the 1.0 million short tons produced in 2003. The lower-than-expected production in 2005 was due to ventilation concerns, difficult geology, and the near exhaustion of reserves at the Pinnacle mine. Production is expected to rebound in 2006 to 2.3 million short tons as no longwall moves are planned.

The majority of the Tower's production, 1.5 million

short tons, came from the Aberdeen mine where longwall equipment was installed in February 2004. The remaining 189,000 short tons was produced by retreat mining in the Pinnacle mine. Mining was completed within the Pinnacle mine's Centennial seam in January of 2006, and crews have moved back into the Gilson seam, where mining will be completed and the mine closed by the end of 2006.

The Aberdeen seam is typically 9 to 10 feet thick, with coal quality averaging 12,200 British thermal units (Btu) per pound and a sulfur content of 0.5%. Currently, equipment is mining at a depth of 2800 feet with plans to approach a depth of 3150 feet, which is deeper than any longwall machine has ever successfully been used in the U.S. ANDALEX says that the longwall machine is running well at these depths, but the development work with continuous miners causes delays and concerns. In order to mitigate "bounce" problems, large barriers of coal are left between longwall panels for additional support. As is typical in gassy Book Cliffs coal mines, production is also limited by the ability to adequately ventilate the mine. ANDALEX is drilling gob-vent gas wells in order to aid in ventilation. In spite of these challenges, the BLM has praised ANDALEX for achieving maximum coal recovery.

Despite the challenges involved with mining the Aberdeen seam, ANDALEX has applied for a lease-modification to acquire an additional 4.0 million short tons of reserves located north of their current leases. In addition, ANDALEX is trying to acquire the Kenilworth federal tract, and a small amount of fee coal, located to the west in order to extend the life of their current operation. If successful, ANDALEX would mine the Aberdeen seam, which is located stratigraphically below the old mine workings in the Kenilworth seam. This new tract could yield up to 16.5 million short tons of coal. Safe access to this tract requires the development of new mains.

GENWAL Resources, Inc. - Crandall Canyon and South Crandall Canyon Mines

ANDALEX Resources and IPA share equally in ownership of the Crandall Canyon and South Crandall Canyon mines, both of which are located in the Wasatch Plateau. The mines are operated by GENWAL Resources, Inc., a wholly owned subsidiary of ANDALEX Resources.

Production at Crandall Canyon and South Crandall Canyon totaled 1.8 million short tons in 2005, up 86.5% from 975,000 short tons in 2004. Production is expected to decrease slightly to 1.7 million short tons in 2006. After Crandall Canyon's longwall equipment was moved to the Aberdeen mine in 2003, the company installed a low-profile longwall machine in October of 2004. This specialized longwall, capable of mining seams to a minimum of 5.2 feet thick, operated within the Blind Canyon seam of the Crandall Canyon mine until August of 2005. High ash was the main concern with the coal produced during this period because the coal seam thinned to only 4 feet. GENWAL is currently pulling pillars in Crandall Canyon and plans to close the mine in 2008.

The low-profile longwall equipment was transferred to the South Crandall mine where production began in the spring of 2006. GENWAL plans to mine coal in the South Crandall's Hiawatha seam until 2008. Up to 12.7 million

short tons of reserves could be mined, but the complicated geology and the thin lenticular coal seam makes mining very difficult.

WEST RIDGE Resources, Inc. – West Ridge Mine

The West Ridge mine began operation in 1999 in the Book Cliffs coal field with production from the lower Sunnyside seam. The mine is operated by WEST RIDGE Resources while mine assets are co-owned equally by IPA and ANDALEX.

After reaching an all-time high of 3.0 million short tons in 2003, production decreased by 24.2% in 2004 to 2.3 million short tons, but then rebounded to 2.6 million short tons in 2005, and is expected to remain at that level in 2006. WEST RIDGE will move to a new sequence of panels in 2006, located northwest of older workings, where they will mine roughly 75% federal and 25% state coal. Current mining depths are between 2000 and 2500 feet with no current plans to go deeper. Difficult mining conditions at the West Ridge mine result in ash contents averaging around 9.6%. Estimated reserves currently under lease total roughly 37 million short tons.

Canyon Fuel Company – Arch Coal

Dugout Canyon Mine

Dugout Canyon produced 4.6 million short tons of coal from the Gilson seam in 2005, 20.5% more than the 3.8 million short tons produced in 2004. Operators expect to produce a similar amount in 2006. Production ended in the Rock Canyon seam in February of 2004, after which longwall equipment was moved to the stratigraphically lower Gilson seam. Parts of three longwall panels had to be abandoned in the Rock Canyon seam because of “bounce” problems and in-seam rock partings.

Starting in 2005, improved geologic conditions resulted in better quality coal and increased production. However, as with all Book Cliffs operations, production is sometimes limited by how fast methane can be vented from the working face. In addition to the vent wells already in place, a second ventilation fan began operation in November of 2005 in nearby Pace Canyon to help alleviate this problem. Also, with cover depths reaching 2800 feet in some places, great care is being taken to address “bounce” problems and provide safe working conditions. Barriers are left between longwall panels for added support, and operators are experimenting with artificial coal seam fracturing to help reduce overburden stress.

The majority of Dugout coal mined in 2005 came from federal leases and this will continue until August of 2006, after which mining will begin on adjacent state leases. Dugout’s recoverable reserves are estimated at 38 million short tons, with an additional 10 million short tons of potential reserves remaining at the idled Soldier Canyon mine.

Skyline Mine

The Canyon Fuel Company’s Skyline mine, located in the Wasatch Plateau, was closed in May of 2004 due to substantial water intrusion and the resultant increased cost of operation. Production in 2004 before the mine closure

totaled only 551,000 short tons, significantly less than the 3.7 million short tons averaged between 1996 and 2003. The closure of the Skyline mine greatly reduced Utah’s overall production total for 2004, creating coal shortages that forced some users of Utah coal to look elsewhere to meet demand.

With the recent rise in coal price, Canyon Fuel decided to reopen the Skyline mine in February of 2005. Mining has shifted to the Lower O’Connor ‘A’ seam in the North lease (Winter Quarters lease) in Carbon County, which does not have the water problems found with the previously mined Lower O’Connor ‘B’ seam, located farther south in Emery County. Production for 2005 totaled 405,000 short tons from development work in preparation for future longwall mining.

Longwall equipment began mining in May of 2006 and should increase production for the year to an estimated 1.4 million short tons. With a full year of longwall operation scheduled for 2007, production should increase even further to 2.4 million short tons. Operators estimate that 13 million short tons of reserves are located in the North lease area south of the Winter Quarters graben, and an additional 12 to 13 million short tons of coal may exist north of the graben. Several exploratory wells have been drilled north of the graben with plans for more drilling during the summer and fall of 2006.

Reserves within the Lower O’Connor ‘B’ seam, some still under lease but the majority unleased federal coal, are estimated at 21 million short tons. Water problems with recovery of these reserves will have to be solved before mining can occur.

SUFECO Mine

SUFECO is Utah’s largest coal producer and the sixth largest underground coal mine in the U.S. It is also the only coal mine in Sevier County. SUFECO produced 7.6 million short tons in 2005 from the upper Hiawatha seam and is expected to increase that total slightly to 7.8 million short tons in 2006. Coal must be promptly trucked to distant stock piles at the Levan loadout or the Hunter power plant due to the small surface storage space at this isolated mountain facility. SUFECO loads roughly 900 trucks a day, five days a week.

Current production is from the Pines federal tract, with longwall production expected to last until the winter of 2007. When longwall panels in the Pines are finished, primary production will move to the newly leased, state-owned, Muddy tract, where production will also be from the upper Hiawatha seam. Development work has already started in this new area where the new working face will be only 6 miles from the portal, as opposed to 13 miles of travel to the last panel of the Pines tract. This state-owned Muddy lease is estimated to have 13 million short tons of coal, while the adjacent unleased federal Muddy tract has reserves in the lower Hiawatha seam totaling 25 to 30 million short tons.

SUFECO is still pursuing a permit to build the “Quitcupah Creek” access road to the mine that would shorten travel distance to Emery County power plants by more than 25 miles. A Final Environmental Impact Statement was released in January of 2006, and a Record of Decision by both the BLM and the Forest Service was announced in March of 2006. Both agencies chose “Alternative D”, the Water Hollow Road Alignment, which generally follows an existing

road in Convulsion Canyon for 2.1 miles where it crosses Quitchupah Creek and then continues for approximately half a mile to the Fishlake National Forest boundary and on to State Route 10. The Forest Service decision was appealed but upheld in court. The final construction plan is being reviewed and it looks as though the project will move forward shortly. For more information, please refer to the Forest Service Web site at <http://www.fs.fed.us/r4/fishlake/projects/quitcupah/>.

Consolidation (Consol) Coal Company

Emery Mine

Consolidation Coal Company (Consol) is one of the nation's largest coal producers. Consol's Emery mine produced intermittently during 2003 and shut down in August of that year after producing 243,000 short tons. The mine reopened in August of 2004 and produced 256,000 short tons before year-end. During 2005, the Emery mine secured several contracts and produced 1.2 million short tons. It is expected to produce 1.3 million short tons in 2006.

A new portal was opened in 2003, providing access to the "I" seam, which is between 20 and 25 feet thick and under just 60 feet of cover at the portal. Three continuous miners remove the upper 10 to 12 feet of coal first, then go back after bolting the roof and remove the lower portion of the seam. Coal quality averages 12,000 Btu per pound and roughly 1.0% sulfur. The majority of production is from private land supplemented with a smaller amount of federal coal. Reserves are estimated to be roughly 40 million short tons, and some estimates suggest more than 100 million short tons are available in the surrounding unleased area.

C.W. Mining Company (Co-op)

Bear Canyon Mines

Coal production at the privately owned Bear Canyon mines peaked in 2001 at 1.3 million short tons before declining to just 339,000 short tons in 2004, primarily due to labor problems. Production increased in 2005 to 456,000 short tons, with a more substantial increase, to 800,000 short tons, expected in 2006. Reserves are estimated at more than 23 million short tons, all currently planned to be mined using continuous mining equipment. The west side of Bear Canyon property (Bear Canyon #1) has been mined-out, and operations have moved to the east side, where production comes from the Blind Canyon (Bear Canyon #3) and Tank (Bear Canyon #4) seams, both of which range from 6 to 10 feet thick. Coal quality averages 11,900 Btu per pound, 0.7% sulfur, and 12% ash.

Energy West Mining Company (PacifiCorp)

Deer Creek Mine

Coal produced from the Energy West Mining Company's Deer Creek mine moves via conveyor belt to PacifiCorp's Huntington power plant located near the mouth of the mine in Huntington Canyon. In addition, smaller amounts of Deer Creek coal go by truck to PacifiCorp's Hunter power plant,

located south of the town of Castle Dale. Production has declined in the last few years, from 3.9 million short tons in 2003 to 3.4 million short tons in 2004, as development work began on the new Mill Fork tract, and as the company recovered coal from smaller, isolated longwall panels on prior leases. Production increased to 3.9 million short tons in 2005 as longwall equipment began operation in the state-owned Mill Fork tract and it is expected to stay at this level for the next few years. The Mill Fork tract is estimated to contain roughly 55 million short tons of coal in two seams, the Blind Canyon and Hiawatha, and mining in the tract should continue for the next 15 to 20 years. The two seams are each 7 to 9 feet thick, separated by 80 to 100 feet, and are located under 1800 to 2600 feet of cover. Coal is currently being produced from the Hiawatha seam, while rock slopes are being excavated to reach the stratigraphically higher Blind Canyon seam.

Energy West is constructing new entry portals in Rilda Canyon that will allow for efficient and safer access to the ever more distant working face. A fan will also be installed to aid in ventilation of the Mill Fork tract. Coal production will still exit through existing portals in Deer Creek Canyon.

Energy West has nominated for leasing the state-owned Cottonwood tract. If successful, they plan to use the currently closed Trail Mountain mine as their access to the new reserve.

Hidden Splendor Resources, Inc.

Horizon Mine

Production at the Horizon mine ceased temporarily in February of 2003, with the sale of assets and lease holdings from Lodestar Resources, Inc. to Hidden Splendor Resources, Inc. Operations resumed in August of that year, resulting in total 2003 production of 108,000 short tons, down only slightly from 2002 production of 110,000 short tons. A full year of production in 2004 with just one continuous miner yielded 293,000 short tons, with similar production of 286,000 short tons in 2005. Hidden Splendor estimates 2006 production at 300,000 short tons, but believe they can double their production in 2007 if a second continuous miner comes online.

Available coal under lease totals roughly 5.0 million short tons. However, potential leases with another 13 million short tons of coal lie on federal land to the northwest of the mine, but this reserve needs further exploration. Current production is primarily in lease areas north and west of the portal, where the Hiawatha seam averages 7 feet thick and is under 1000 feet of cover. Coal quality is typical of the Wasatch Plateau and averages 11,700 Btu per pound, 0.6% sulfur, and 5.0% moisture. Water infiltration has been somewhat of a problem, but water quality is good making disposal less of an issue. Longwall production is not feasible at this mine due to numerous faults, the small reserve, and other geologic features.

UtahAmerican Energy, Inc.

Lila Canyon Mine

UtahAmerican Energy's proposed Lila Canyon mine is

located south of Horse Canyon in the Book Cliffs coal field in Emery County. UtahAmerican is still working on acquiring the necessary permits, and development work could start as soon as late 2007. By the time the facility is at full working capacity, which would take 2 to 3 years after a permit is issued, it could employ up to 200 people and produce up to 4.5 million short tons of coal a year. Coal would be mined from the upper and lower Sunnyside seams, which are combined in this area and average 13.0 to 13.5 feet thick. Recoverable reserves are estimated between 26 and 40 million short tons.

Bronco Coal Company

Razor Mine

In the spring of 2005, Arizona-based Bronco Coal Company bought the land and mineral rights to the old Columbia mine located just south of the town of Sunnyside in the Book Cliffs coal field in Carbon County. The Columbia mine produced coal from 1923 to 1966 when it was operated by US Steel Corporation. Bronco is at the early stages of the permitting process with at least several years before a permit could be issued. Reserves for the proposed Razor mine are located east of the old workings of the Columbia mine in the upper and lower Sunnyside seam, which is combined in this area and averages 15.0 feet thick. Depth of cover could be an issue for future mining because overburden ranges from 1500 to 3500 feet. Potential reserves for the entire area could total as much as 106 million short tons, with 38 million short tons located on company-owned land.

Alton Coal Development, LLC

Alton Mine

Alton Coal Development, LLC has started collecting baseline information for the permitting process for a new mine located in the Alton coal field in southern Utah's Kane County. The proposed surface mine would produce sub-bituminous coal that ranges from 9500 to 10,000 Btu per pound, and averages about 1% sulfur and 9% ash. The company would initially mine coal on private property before moving to adjacent, yet-to-be-leased, federal land. Recently, several new exploratory wells were drilled on company land confirming previous drilling information on the in-ground reserve. This new mine could produce up to 2 million short tons a year from a proposed reserve base of approximately 40 to 45 million short tons.

DISTRIBUTION OF UTAH COAL

The total amount of Utah coal distributed to market is proportional to the amount of Utah coal production. With an increase in production in 2005, distribution of Utah coal also increased to 24.7 million short tons, up 8.5% from 2004 (table 7). The majority of that increase occurred in the electric utility sector, where distribution increased from 18.7 million short tons in 2004 to 20.4 million short tons in 2005. Coal delivered to the industrial sector increased from 3.5 million short tons in 2004 to 4.1 million short tons in 2005,

while coal going to residential and commercial customers decreased from 280,000 short tons in 2004 to just 53,000 short tons in 2005. With another significant increase in production expected in 2006, distribution of Utah coal is also expected to rise. Operators plan to deliver a total of 26.2 million short tons of Utah coal, a 6.1% increase over 2005, with 22.2 million short tons going to electric utilities, 4.0 million short tons to industrial users, and 48,000 short tons going to residential and commercial customers. The following sections provide descriptions of major electric utility and industrial customers that use Utah coal; however, this is not an exhaustive list.

Electric Utility Market

During 2005, 82.3% of Utah coal, 20.4 million short tons, was delivered to the electric utility market in both Utah and other states (table 7). In 2005, burning coal accounted for 95.8% of all electricity generated in Utah, which is substantially more than the U.S. average of 49.9%. If electricity consumption continues to increase, demand for Utah coal at power plants should remain high.

Out-of-State Electric Utility Market

Electric utility companies outside of Utah received 5.9 million short tons of Utah coal in 2005, an increase of 2.3% from 2004, but still significantly less than peak deliveries of 7.7 million short tons in 1998 (table 7). Nevada received the majority of that coal, 3.1 million short tons, while 897,000 short tons went to electric utility markets in Wisconsin, 871,000 short tons went to electric plants in Tennessee, and 658,000 short tons went to California cogeneration plants (table 8). The remaining 383,000 short tons went to electric utility markets in Kentucky, Michigan, Missouri, and Nebraska.

Nevada Plants – Reid Gardner and North Valmy Power Plants: Sierra Pacific and Nevada Power jointly own and operate seven power generation stations that serve Nevada and northeastern California. Nevada Power also owns a minority interest in two other power plants, and the partnership buys power from other generators. Utah coal is distributed to two plants in this system, the Reid Gardner plant, which serves the Las Vegas area, and the North Valmy plant, which is located near Battle Mountain, Nevada.

Reid Gardner is a conventional power plant, which was originally rated at 580 megawatts (MW), but has since been downgraded to a capacity of 558 MW. The plant purchased 1.5 million tons of Utah coal in 2005, with smaller amounts purchased from Colorado (table 9). Utah coal purchases in 2006 are expected to increase to 1.7 million short tons. Net power generation in 2005 was steady at 3933 gigawatthours (GWh) running at 79.9% of capacity. Plant availability will decrease slightly from 83.7% in 2005 to 80.8% in 2006, resulting in an expected net generation of 3751 GWh.

North Valmy is also a conventional power plant with a capacity rating of 522 MW. In 2005, the plant received 1.6 million short tons of Utah coal and about 500,000 short tons of coal from Wyoming, which is much more than the 58,000 short tons purchased from Wyoming in 2003. Operators plan to double the amount of coal purchased from Wyoming in 2006, and reduce the amount of purchased Utah coal to

Table 7. Distribution of Utah Coal, 1981-2006.

Thousand short tons

Year	Production	Distribution of Utah Coal												Exports ³	Total
		Electric Utilities ¹			Coke Plants			Industrial ²			Residential & Commercial				
		Outside UT	In UT	Total	Outside UT	In UT	Total	Outside UT	In UT	Total	Outside UT	In UT	Total		
1981	13,808	2,688	4,829	7,517	779	267	1,046	1,645	493	2,138	180	197	377	3,472	14,550
1982	16,912	3,643	6,135	9,778	859	136	995	1,349	728	2,077	233	177	410	2,177	15,437
1983	11,829	3,404	5,220	8,624	0	32	32	1,091	581	1,672	292	191	483	1,346	12,157
1984	12,259	3,730	4,688	8,418	0	163	163	1,542	466	2,008	311	257	568	849	12,006
1985	12,831	3,746	7,192	10,938	0	39	39	1,866	352	2,218	312	252	564	625	14,361
1986	14,269	2,989	6,955	9,944	0	485	485	1,745	271	2,016	81	191	272	551	13,268
1987	16,521	3,182	10,772	13,954	0	131	131	1,813	249	2,062	83	204	287	555	16,989
1988	18,164	2,797	11,233	14,030	0	171	171	1,996	679	2,675	88	236	324	1,044	18,244
1989	20,517	2,623	11,563	14,186	0	355	355	2,401	765	3,166	84	323	407	2,175	20,289
1990	22,012	3,373	12,604	15,977	0	617	617	2,327	612	2,939	59	380	439	1,708	21,680
1991	21,875	3,608	12,162	15,770	0	615	615	2,158	622	2,780	76	320	396	2,112	21,673
1992	21,015	4,000	11,619	15,619	0	553	553	2,006	488	2,494	81	347	428	2,245	21,339
1993	21,723	3,914	11,842	15,756	0	510	510	2,146	594	2,740	134	228	362	2,567	21,935
1994	24,422	4,841	12,344	17,185	0	109	109	2,322	643	2,965	308	157	465	2,717	23,441
1995	25,051	6,570	11,771	18,341	0	0	0	2,399	642	3,041	68	182	250	3,811	25,443
1996	27,071	7,258	11,923	19,181	0	0	0	2,339	517	2,856	51	260	311	5,468	27,816
1997	26,428	5,638	13,271	18,909	0	0	0	2,164	665	2,829	60	96	156	3,513	25,407
1998	26,600	7,704	12,812	20,516	0	0	0	2,749	680	3,429	82	212	294	2,735	26,974
1999	26,491	6,910	13,162	20,072	0	0	0	2,529	830	3,359	75	107	182	2,567	26,180
2000	26,920	6,639	14,276	20,915	0	5	5	2,892	634	3,526	141	82	223	2,960	27,629
2001	27,024	7,419	12,480	19,899	0	0	0	3,055	792	3,847	254	394	648	2,404	26,798
2002	25,299	5,562	13,009	18,571	0	0	0	3,543	735	4,278	282	372	654	875	24,378
2003	23,069	6,789	13,121	19,910	0	0	0	2,856	633	3,489	28	50	78	222	23,699
2004	21,818	5,798	12,947	18,745	0	0	0	2,902	590	3,492	128	152	280	295	22,812
2005	24,556	5,934	14,428	20,362	0	0	0	3,238	875	4,113	9	44	53	212	24,740
2006*	26,715	6,424	15,740	22,164	0	0	0	3,313	713	4,026	9	40	48	0	26,239

Source: UGS coal company questionnaires

¹Includes cogeneration facilities²A large portion of out-of-state industrial deliveries are most likely going to cogeneration plants, which are only required to use 5.0% of their power for industrial use; the remainder typically goes into the consumer power grid.³Exports from 1981 to 2003 went overseas to the Pacific Rim, while 2004 to 2005 exports went to Canada.

*Forecast

Table 8. Distribution of Utah Coal by State, 2005.

Thousand short tons

Destination	Residential	Commercial	Industrial	Electric Utility ¹	Total
Arizona			221		221
California			2,036	658	2,695
Colorado			*		*
Idaho	*	8	154		163
Kansas		*			*
Kentucky				10	10
Michigan			120	4	123
Missouri			8	358	365
Nebraska				11	11
Nevada			351	3,124	3,476
Oregon			124		124
Tennessee				871	871
Utah	22	22	875	14,428	15,347
Wisconsin			223	897	1,121
Wyoming	*	*			*
Exports - Canada			19	193	212
Total – U.S.	22	31	4,113	20,362	24,527
Total – U.S. and Exports	22	31	4,132	20,556	24,740

Source: UGS coal company questionnaires

¹Includes cogeneration facilities

*Amounts less than 500 tons

Table 9. Utah and non-Utah Coal Purchases by Select Companies, 2003-2006.

Thousand short tons

Company	Plant Location	Coal Purchased in 2003		Coal Purchased in 2004		Coal Purchased in 2005		Coal Purchased in 2006*	
		UT coal	non-UT coal	UT coal	non-UT coal	UT coal	non-UT coal	UT coal	non-UT coal
PacifiCorp - Carbon	UT	657		567		677		600	
PacifiCorp - Hunter	UT	3,839		4,150		4,967		5,328	
PacifiCorp - Huntington	UT	2,891		3,326		3,035		2,577	
DG&T - Bonanza	UT		2,036		2,553		2,142		2,004
IPP	UT	5,304		5,270	468	5,457	634	5,635	200
Ash Grove Cement	UT	124		123		123		126	
Graymont	UT	150		166		156		165	
Holcim	UT	70		79	7	84	0.5	37	40
Kennecott Copper	UT	400		207	178	398		446	
Utelite	UT	na	na	na	na	25	9	9	9
ACE Cogen. Plant ¹	CA	222		300		351		388	
Mt. Poso Cogen. ¹	CA	150		114		156		160	
Rio Bravo Jasmin Cogen. ¹	CA	66		41		33		71	
Rio Bravo Poso Cogen. ¹	CA	66		49		49		71	
Stockton Cogen.	CA	121	9	135	21	141	22	115	29
North Valmy Power Plant	NV	1,220	58	1,356	487	1,611	537	975	1,000
Reid Gardner Power Plant	NV	1,756	48	1,721	187	1,490	330	1,730	235
Total		17,036	2,153	17,605	3,901	18,751	3,675	18,433	3,516

Source: UGS coal company questionnaires

Note: This table only includes a sampling of companies that use Utah coal. This is not an exhaustive list.

¹Reports coal purchased only in Utah

*Forecast

975,000 short tons. In 2005, the North Valmy plant generated a net of 3952 GWh with an availability of 87.2%. Availability is expected to decrease in 2006 to 84.4%, decreasing net generation to 3820 GWh.

Utah Electric Utility Market

Due in most part to a substantial increase in production, the amount of Utah coal delivered to electric utilities within the state hit a new all-time high in 2005 of 14.4 million short tons, increasing 11.4% over 2004's total of 12.9 million short tons (table 7). Additional increases in production in 2006 should again result in record-high Utah deliveries of 15.7 million short tons. Demand for coal at Utah power plants is expected to remain high as electricity needs continue to grow.

PacifiCorp – Hunter: The three units at the Hunter power plant have a combined total capacity of 1320 MW and produced a net of 9743 GWh of power in 2005. Hunter purchased 5.0 million short tons of Utah coal in 2005, up from 4.2 million short tons in 2004, relying mostly on Canyon Fuel mines (table 9). Hunter expects to receive 5.3 million short tons of Utah coal in 2006. The company estimates net power generation for 2006 to total about 10,232 GWh, which would be a new single-year high.

Hunter began operation in 1978 with Unit 1; Units 2 and 3 began supplying power in 1980 and 1983, respectively. Hunter Plant Unit 1 is jointly owned by PacifiCorp and Provo City with undivided interest of 93.75% and 6.25%, respectively. Hunter Plant Unit 2 is owned by PacifiCorp, Deseret Generation and Transmission Cooperative, and Utah Associated Municipal Power Systems, each with an undivided

interest of 60.31%, 25.11%, and 14.58%, respectively. Hunter Unit 3 is wholly owned by PacifiCorp.

PacifiCorp – Huntington: Completed in 1977, PacifiCorp's Huntington plant was built in Huntington Canyon, very close to PacifiCorp's Deer Creek mine. Huntington's two units have a combined capacity of 895 MW. In 2005, Huntington generated a net of 6381 GWh, roughly the same as in 2004, but down from the plant's peak of 7207 GWh generated in 2003. Power generation is expected to decrease in 2006 to 6344 GWh.

Huntington's coal purchases decreased slightly to 3.0 million short tons in 2005 from 3.3 million short tons the year before (table 9). The Deer Creek mine continues to supply the vast majority of coal used at the Huntington plant, with smaller amounts coming from Canyon Fuel mines. Coal delivery in 2006 is expected to total 2.6 million short tons.

PacifiCorp – Carbon: The Carbon power plant, which began operation in 1954, is PacifiCorp's oldest and smallest coal-fired power plant in Utah. Located at the intersection of State Route 6 and 191, just north of Helper, Carbon has two units with a combined capacity of 174 MW. Coal delivered to Carbon increased from 567,000 short tons in 2004 to 677,000 short tons in 2005 (table 9). The plant generated a net of 1350 GWh in 2005, slightly less than the 1358 GWh generated in 2004. Net generation for 2006 is expected to be near 1297 GWh.

During 2005, the Carbon plant utilized coal from five different mines; the majority came from two Canyon Fuel mines, with smaller amounts from Deer Creek, Horizon, and Co-op. Coal purchases are expected to decrease to 600,000

short tons in 2006, with increasing amounts coming from the Deer Creek mine.

Intermountain Power Agency – Intermountain Power Project: The Intermountain Power Agency (IPA) and its Intermountain Power Project (IPP), located just north of Delta, were created in 1977 to meet the power needs of Utah and southern California. Power purchasers include 23 Utah municipalities (entitlement share of 14%), six Utah cooperatives (7%), Utah Power and Light (PacifiCorp) (4%), and six California municipalities (75%). The Power Sales Contracts for these entities will expire in 2027. The plant is operated and managed by the Los Angeles Department of Water and Power. For more information on IPA, visit their Web site at <http://www.ipautah.com/>.

As of April 2004, IPP increased its capacity rating to 1800 MW, making it the largest power generation facility in Utah. In 2005, IPP generated a net of 13,664 GWh of power, down 5.3% from the 14,435 GWh produced in 2004. IPP purchased a total of 6.1 million short tons of coal in 2005, 5.5 million short tons from Utah, and 634,000 short tons from Wyoming (table 9). IPP first purchased out-of-state coal from Wyoming and Colorado in 1997. Out-of-state coal purchases for 2006 are expected to total only 200,000 short tons. With a large increase in Utah coal production in 2005 and another large increase expected for 2006, IPP can satisfy more of their demand with Utah purchases and rebuild their stockpile. For 2006, IPP is expecting power generation to increase to a net of 14,279 GWh, and coal deliveries are projected to total 6.5 million short tons, a 6.5% increase over 2005.

Plans for expanding IPP by adding a third unit would increase generation capacity by another 900 MW. This additional capacity, expected to come online in 2013, is intended to supply power to communities in Utah, Nevada, Arizona, and California. Coal consumption would rise almost 50% with such an expansion, with demand expected to be met by Utah, Wyoming, and Colorado coal.

Cogeneration Market

Out-of-State Cogeneration Plants

Cogeneration plants (“cogen”) in California are major customers of Utah coal. Cogen facilities provide process steam and power for industry, but are primarily devoted to generating electricity for consumer markets, generally providing a maximum allowable 95% of total net capacity to the grid. The increasing stringency of California air quality standards means that conventional stoker power plants, particularly for coal, will eventually give way entirely to cleaner technology. At present, circulating fluidized-bed combustion is the most popular technology for cogen facilities due to its low oxide emissions and its ability to burn a variety of fuels, including high-ash coal.

ACE Cogeneration: Located near Bakersfield, California, ACE Cogeneration, with a capacity of 102 MW, produced a net of 764 GWh of electricity during 2005 using a combination of Utah coal and petroleum coke. In addition to generating electricity, the power plant supplied process steam to an adjacent chemical company as required by its cogeneration status. Plant availability during 2005 reached 89.9% and is expected to increase slightly to 91.1% in 2006 with power

generation reaching 787 GWh. Deliveries of Utah coal in 2005 totaled 351,000 short tons, up 17.1% compared with 2004, and deliveries are expected to increase again in 2006 to 388,000 short tons (table 9).

Mt. Poso: Located in the San Joaquin Valley, Mt. Poso is a 58 MW cogeneration plant that is owned by the Millennium Energy Company. The required minimum 5.0% of energy generation is devoted to steam production for enhanced oil recovery at nearby oil wells. As with other cogeneration plants, the remaining generation is supplied to the consumer grid. In 2005, Mt. Poso generated a net of 440 GWh of electricity, an increase of 4.0% over 2004. Plant utilization and availability were at 97.5% and 95.4%, respectively. Net generated power is expected to decrease slightly in 2006 to 424 GWh. During 2005, Mt. Poso purchased 156,000 short tons of Utah coal, 36.5% more than the 114,000 short tons purchased in 2004 (table 9). Utah coal deliveries are expected to increase slightly in 2006 to 160,000 short tons.

Rio Bravo Poso: Rio Bravo Poso uses circulating fluidized-bed combustion to generate power at a rated net capacity of 33 MW. Like Mt. Poso, this Constellation Operating Service plant distributes at least 5.0% of generated energy to steam-based enhanced recovery at nearby oil wells. Remaining power is sold into the California grid.

Rio Bravo Poso generated a net of 297 GWh in 2005 and purchased 49,000 short tons of Utah coal (table 9). Plant utilization and availability were 102.6% and 96.2%, respectively. Plant utilization during 2006 is expected to decrease slightly to 100.3%, and power generation is expected to decrease to 290 GWh. Utah coal deliveries in 2006 are expected to substantially increase to 71,000 short tons.

Rio Bravo Jasmin: Rio Bravo Jasmin is a Constellation-owned plant located 7 miles from the nearly identical Rio Bravo Poso. Both plants provide roughly the same amount of steam for enhanced oil recovery in the surrounding oil fields. Remaining generation is sold to Southern California Edison.

Plant utilization and availability in 2005 were 100.0% and 98.2%, respectively, producing a net of 291 GWh of electricity. Rio Bravo Jasmin purchased 33,000 short tons of Utah coal in 2005, down from 41,000 short tons purchased in 2004 (table 9). Net electricity generation for 2006 is expected to remain the same, while Utah coal purchases are expected to more than double to 71,000 short tons.

Stockton Cogeneration Company: The Stockton Cogeneration facility in California was created to supply process heat for agricultural products. In 2005, the plant generated a net of 445 GWh on a base rating of 55 MW running at 94.9% availability. Stockton plans to increase power generation in 2006 to a net of 452 GWh by increasing availability to 96.2%. Stockton purchased a total of 163,000 short tons of coal in 2005, of which 141,000 short tons, or 86.4%, was from Utah (table 9). Utah coal deliveries are expected to decrease in 2006 to 115,000 short tons, while 29,000 short tons will come from Colorado.

Utah Cogeneration Plant

Sunnyside Cogeneration Plant: The Sunnyside Cogeneration plant, located in the town of Sunnyside, Utah, was originally designed as a true cogeneration plant, which would

have supplied 5.0% of its power to a commercial greenhouse. However, since the plant burns waste coal, it is designated as a “qualifying facility”, which under the Federal Public Utility Regulatory Policy Act, is exempt from the cogeneration requirement, and the proposed commercial greenhouse was never developed. Subsequently, all of Sunnyside’s power goes directly to the grid.

The Sunnyside plant, rated at a net of 51 MW, uses circulating fluidized-bed combustion technology to burn waste coal left from the Kaiser Sunnyside coal wash operation and coal from the old Star Point waste pile. The heating value of the Sunnyside fuel varies from 4000 to 5500 Btu per pound, which is less than half the Btu value for most Utah coal. The sulfur content of the fuel averages about 1.5%.

Constellation’s Sunnyside power station consumed about 488,000 short tons of waste coal during 2005. At that rate, Sunnyside waste coal “reserves” on site are expected to last three to five more years. In anticipation of the Sunnyside resource depletion, Constellation purchased a waste coal pile from a wash plant associated with the now-closed Cyprus-Plateau Star Point mine. That fuel is of higher quality than that from Sunnyside, averaging 5700 to 6000 Btu per pound with 0.7% sulfur. With these additional reserves, Sunnyside Cogen should have enough fuel to last until 2025.

Net power generation in 2005 totaled 472 GWh, up from the 466 GWh generated in 2004. This figure is expected to drop slightly in 2006 to 463 GWh based on the consumption of 489,000 short tons of waste coal.

In contrast to conventional coal combustion, where high-ash content hampers performance, the use of circulating fluidized-bed combustion at the Sunnyside plant requires the addition of noncombustible material. The plant consumes about 48,000 tons of pulverized limestone per year, most of which is purchased from the Graymont lime plant in the Cricket Mountains, in order to achieve proper combustion and eliminate sulfur emission. Bag house technology is used to remove fly ash.

Industrial Market

Out-of-State Industrial Market

Deliveries of Utah coal to industrial plants in other states have gradually increased during previous decades with a record 3.5 million short tons shipped in 2002 (table 7). In 2005, deliveries increased by 11.6% over the previous year to 3.2 million short tons. Deliveries for 2006 are expected to increase to 3.3 million short tons as overall Utah coal distribution increases.

California is the largest industrial consumer of Utah coal, with deliveries of 2.0 million short tons in 2005, up slightly from 1.9 million short tons in 2004 (table 8). Deliveries of Utah coal to Arizona, Idaho, Nevada, and Oregon industrial customers all increased in 2005, and new customers in Michigan and Wisconsin added to the overall total. Other states receiving Utah coal for industrial use were Colorado and Missouri.

It is important to note that a large portion of out-of-state industrial deliveries could be going to cogeneration plants. These plants are only required to use 5.0% of their power generation for industrial use, with the remainder typically sold to the power grid.

Utah Industrial Market

The amount of coal delivered to industrial users within the state of Utah has steadily decreased in previous years from 792,000 short tons in 2001 to only 590,000 short tons in 2004 (table 7). Deliveries in 2005 increased dramatically by 48.3% to 875,000 short tons, a new single-year record. During 2004, a few Utah companies had to look elsewhere to meet their coal needs due to lower total Utah coal production. However, with the increase in overall state production in 2005, and further increases expected for 2006, only minor out-of-state coal purchases are planned.

Ash Grove Cement: Ash Grove Cement uses a 25 MW conventional boiler to produce steam and electricity for Portland cement production at its remote site about 25 miles west of Nephi. During 2005, this plant purchased 123,000 short tons of Utah coal, similar to amounts purchased in 2004 (table 9). Plant availability was rated at 90.0% for 2005, on utilization of 87.5%. Utah coal purchases for 2006 are expected to total 126,000 short tons.

Graymont: Graymont Western U.S., Inc., is an affiliate of Graymont Dolime of Genoa, Ohio, one of the largest producers of limestone products in the United States. The Utah operation is located about 40 miles south of Delta, where limestone from the nearby Cricket Mountains is used to produce calcium oxide, “quicklime”, and magnesium oxide in a rotary kiln. Graymont purchased 156,000 short tons of Utah coal in 2005 and expects to increase that amount to 165,000 short tons in 2006 (table 9).

Holcim, Inc.: Holcim is one of the world’s leading suppliers of cement, sand and gravel, and construction-related services. The companies Devil’s Slide plant, located in Morgan County, produces cement and washed aggregates. During 2005, this plant purchased 84,000 short tons of Utah coal and only minor amounts of coal from Wyoming (table 9). In 2006, Holcim plans to purchase only 37,000 short tons of Utah coal and 40,000 short tons of Wyoming coal. Holcim hopes to reduce its future overall coal consumption by increasing the use of alternative fuels.

Kennecott: Kennecott Copper uses coal to produce electricity for copper refining at its Salt Lake County facility. During 2005, Kennecott purchased 398,000 short tons of coal, all from Utah mines, after purchasing nearly half their coal from out-of-state sources in 2004 (table 9). In 2006, coal purchases will increase to 446,000 short tons, all of which will be from Utah. Like many coal users, Kennecott is concerned about stability of price and supply, especially since Kennecott keeps very little coal stocked at the refinery. Increased Utah coal production will hopefully help ease supply concerns and keep demand for Utah coal high.

The Kennecott steam boiler is fed by a conventional stoker and is rated at 175 MW. In 2005, Kennecott produced a net of 737 GWh of electricity, up substantially from the 621 GWh generated in 2004, based on a plant availability and utilization of 77.6%. Generation is expected to dramatically increase again in 2006 to 856 GWh.

Utelite: The Utelite Corporation, located near the town of Coalville, produces expanded lightweight shale aggregates used in applications ranging from structural concrete to geotechnical fill. The raw shale is quarried, crushed, and fed into a rotary kiln where it is heated to 2000 degrees Fahrenheit.

heit, using coal as the fuel source. At this temperature the shale is red hot and somewhat plastic. Internal gases trying to escape the shale expand or "bloat" the particles, creating a myriad of small non-interconnecting internal voids. These voids are retained after the material cools and solidifies. The extreme firing temperature also vitrifies the shale, creating a hard ceramic shell. These attributes account for the material's lightweight, high strength, acoustic, insulative and fire resistant qualities. Utelite purchased 34,000 short tons of coal in 2005, 25,000 short tons from Utah and 9,000 short tons from Wyoming (table 9). Plans for 2006 call for deliveries of 18,000 short tons with equal amounts coming from Utah and Wyoming.

Utah Coking Coal Market

The coking coal market was once a major Utah industry in support of steel-making and other industrial processes. During the early 1990s, an annual average of 1.1 million short tons of coke were delivered to Utah companies, of which about half was produced in-state (table 7). By 1994, as deliveries remained near 1.1 million short tons, Utah stopped producing coke and began receiving it all from out-of-state sources, with the exception of a one-time delivery of 5,000 short tons in 2000 from WEST RIDGE Resources. The last recorded substantial delivery of coke to Utah was in 2001, when some 648,000 short tons were purchased by Geneva Steel before the plant closed later that year.

Residential and Commercial Markets

About 53,000 short tons of Utah coal was shipped to businesses and residences during 2005, with 44,000 short tons going to Utah customers and 9,000 short tons going to customers out-of-state (table 7). This is substantially less than the 654,000 short tons delivered in 2002 and 648,000 short tons delivered in 2001. The recent large swings in total residential and commercial coal deliveries is partly due to changing reporting methods and purchases by commercial coal brokers. Commercial brokers buy and sell substantial amounts of coal each year, with most of their volumes going to utilities for power generation. These commercial transactions may be logged as commercial deliveries, but are probably not going to homes or businesses.

There is little market evidence of coal use by businesses and residences in Utah. Approximately 20 wholesale and retail outlets for coal have been identified in the state, but these sources have dwindled in number, and few proprietors report useful customer information, except to say that a few customers, mostly in rural areas, continue to use coal as a backup fuel or for decorative fireplaces. In addition, a few tons of Pennsylvania anthracite coal is distributed in Utah and nearby states as "boutique" fuel. Due to the expansion of natural gas networks, there are only a few remote locations in Utah where coal still competes favorably with propane, electricity, or renewable sources of energy for residential and commercial applications.

Exports

Demand for Utah coal by foreign countries peaked in the

early 1980s and mid-1990s, reaching a record 5.5 million short tons in 1996, matching peaks in both production and total distribution (table 7). Through 2003, as deliveries dwindled to 222,000 short tons, all exported coal went to Asian markets. In 2004, 295,000 short tons of Utah coal went to Canadian markets followed by 212,000 short tons in 2005. Utah operators do not expect to export any coal in 2006.

Before 2004, Utah mostly exported coal to Japan, but as coal production continues to grow in Asia, this market has virtually disappeared. In fact, a significant resurgence in overseas demand for Utah coal is not expected as China is projected to eventually dwarf all world coal exporters once its own production system matures. Meanwhile, ever since the Port of Los Angeles coal terminal was closed, capability for the western United States to export coal to Asia has significantly declined.

DTE Utah Synfuels, LLC

DTE Energy Services is owner and operator of a synthetic fuel production facility called DTE Utah Synfuels, located near Price. This is the only synfuel plant west of the Mississippi River. The synthetic fuel process begins by combining crushed coal with a chemical reagent. This mixture then undergoes a shaping process using heat and pressure to form an enhanced coal product. The end product is used by customers in electric generating plants and industrial facilities in Utah and other states. DTE Utah sold 1.7 million short tons of synthetic fuel in 2005 with a crew of 24 individuals, including hourly and management personnel. DTE Utah has received waste coal from several Utah mines including Bear Canyon, Horizon, SUFCO, West Ridge, and Dugout.

As of May 12, 2006, the DTE Utah facility has been idled, with plans for restarting dependant on decreasing crude oil prices. The tax credit taken by DTE phases out when oil prices become high. The plant shipped 735,000 short tons of synfuel in 2006 before the May shutdown. In total, DTE has sold about 8.0 million short tons over the life of the plant. Tax credits associated with synthetic fuel production are scheduled to cease at the end of 2007, with little hope for renewal.

Headwaters Energy Services – Wellington Cleaning Facility

Covol Engineered Fuels, a Headwaters Energy Services company, has recently started operation of the Wellington Cleaning Facility across the road from the Savage loadout. The new coal cleaning facility will use a custom waterless system for removing unwanted ash with its associated sulfur and mercury. Headwaters contracts with local end users and brokers to clean high-ash coal, but also buys "waste" coal, which they then clean and resell. At full capacity, the plant is designed to process more than 750,000 short tons of coal per year and employ up to 12 individuals.

Canyon Fuel Company – Castle Valley Coal Preparation Plant

Canyon Fuel Company, LLC, a subsidiary of Arch Western Bituminous Group, LLC, is constructing a new coal pre-

preparation plant at the Savage Coal Terminal in Wellington, Utah. The new preparation plant is being built in the structure that once housed the old ARCO Coal plant. The construction of the Castle Valley Coal Preparation Plant started in March 2006 and commissioning is planned for October 2006.

The plant will utilize a heavy media process and have a capacity of 2 million short tons per year. Canyon Fuel will utilize the plant to optimize coal quality specifications. The plant will enable Canyon Fuel, through its sales agent Arch Coal Sales Company, to offer a premium product with a more consistent ash and BTU content than coals that are not washed.

COAL IMPORTED INTO UTAH

The combination of growing demand and decreasing Utah coal production helped push coal imports to record levels in 2004, when Utah companies imported 3.2 million short tons of Wyoming and Colorado coal, up 57.5% from 2003 (table 10). The vast majority of imported coal went to the Bonanza power plant in eastern Utah, which has always used Colorado coal, but 2004 also saw several faithful users of Utah coal having to look out-of-state in order to meet their needs. However, with the large increase in Utah coal production in 2005, coal imports dropped to 2.8 million short tons, and they are expected to drop again in 2006 to 2.3 million short tons.

Electric Utilities

Deseret Generation and Transmission Co. – Bonanza Plant

Deseret Generation and Transmission Co. (DG&T) is a cooperative of Utah and Colorado municipalities that jointly developed and operate a 458 MW coal-fired power plant located near Bonanza, Utah, a remote area of Uintah County near the Utah-Colorado border. During 2005, the Bonanza power plant purchased 2.1 million short tons of coal from the Deserado mine in Colorado, operated by Blue Mountain Energy, a wholly owned subsidiary of DG&T (table 9). The power plant burned 2.0 million short tons of coal to generate a net of 3716 GWh of electricity in 2005, for distribution to communities in the six cooperative organizations that control the plant.

Power plant availability reached 94.7% in 2005, with plant utilization at 92.6%. Both figures are expected to decrease to 90.0% in 2006, with total net generation of 3397 GWh. Bonanza plans to purchase 2.0 million short tons of coal in 2006, all from Blue Mountain Energy, with no current plans to buy Utah coal.

DG&T has begun the permitting process for a new 86 MW circulating fluidized-bed combustion unit at the Bonanza plant. If the permitting process goes smoothly, DG&T hopes the plant will be running by mid-2009. The new plant would burn waste coal from the Deserado mine.

Intermountain Power Agency – Intermountain Power Project

IPP imported a total of 634,000 short tons of coal in 2005, 10.4% of their overall deliveries, from two different

Table 10. Utah Coal Imports, 1981-2006.

Thousand short tons

Year	Electric Utilities	Coke Plants	Industrial	Res./Com.	Total
1981	8	1,030	98	0	1,136
1982	18	695	84	0	797
1983	0	854	83	0	937
1984	224	1,229	85	1	1,539
1985	193	1,289	98	0	1,580
1986	659	383	103	0	1,145
1987	905	160	100	0	1,165
1988	1,300	1,088	60	0	2,448
1989	1,400	922	45	0	2,367
1990	1,449	679	7	2	2,137
1991	1,310	695	2	0	2,007
1992	1,517	629	9	0	2,155
1993	1,501	579	20	0	2,100
1994	1,495	1,089	4	0	2,588
1995	779	1,062	0	0	1,841
1996	805	1,120	0	0	1,925
1997	1,509	1,106	0	0	2,615
1998	1,733	982	0	0	2,715
1999	1,431	728	0	0	2,159
2000	1,531	936	0	0	2,467
2001	2,028	648	0	0	2,676
2002	2,074	0	16	0	2,090
2003	2,036	0	0	0	2,036
2004	3,021	0	185	0	3,206
2005	2,776	0	10	0	2,786
2006*	2,204	0	49	0	2,253

Source: UGS coal company questionnaires

*Forecast

companies in Wyoming (table 9). This is the second year that Intermountain has purchased significant amounts of out-of-state coal; 468,000 short tons was purchased in 2004. Volatile prices, quality issues, and short supplies in the last few years have necessitated the need to look to other states to meet demand. With increased supplies available in Utah, IPP plans to purchase only 200,000 short tons of Wyoming coal in 2006. If Intermountain builds a third unit, it is uncertain if the coal will primarily come from in-state mines or from other sources.

Industrial Plants

Holcim's Devil's Slide cement plant imported a very small amount of coal from Wyoming in 2005, but plans to purchase 40,000 short tons in 2006, just over half their total deliveries (table 9). The company cites coal quality issues as the main reason for purchasing out-of-state coal. The Kennecott Copper Company imported 175,000 short tons of coal from Wyoming and 2500 short tons from Montana in 2004, but did not purchase any out-of-state coal in 2005, and has no plans to use out-of-state coal in 2006 (table 9).

Minor Coal Imports

Small amounts of coal for specialized purposes are imported into Utah from other states. Anthracite coal from Pennsylvania is burned in some residential fireplaces, and eastern coke is used by some steel fabricators and foundries. These markets are small and are declining as natural gas replaces coal in nearly all but the most remote areas, and markets for specialized uses in homes and industry are limited and relatively insignificant.

OUTLOOK FOR UTAH'S COAL INDUSTRY

After a 10-year low in 2004, Utah coal production increased by 12.6% to 24.6 million short tons in 2005 and is expected to increase even further in 2006 and 2007. Rising coal prices, increased employment, the reopening of the Skyline mine, significant production increases at several other Utah mines, and the proposed opening of three new coal operations all suggest a brighter future for Utah's coal industry.

In the long term, coal should continue to be the most important fuel produced in the United States for electricity generation. Known reserves of coal are expected to last more than 200 years, much longer than known reserves of petroleum and natural gas.

In 2006, coal-fired power generation is projected to supply more than a third of worldwide electricity demand, roughly 50% of the United State's electricity needs, and about 95% of Utah's electricity generation. Thanks to abundant reserves of coal, Utah consumers will continue to enjoy a stable supply of electricity from its coal-fired power plants, and electricity prices will continue to be among the lowest in the nation. Utah will also continue to be a net exporter of electricity.

In recent years, air quality concerns and demand for peaking capacity have increasingly favored natural gas as a fuel for electric generation. However, recent projections for a growing price differential between natural gas and coal appear to be moderating that outlook, and 1200 MW of new Utah coal-fired power plant capacity is in the planning stage.

Emission standards remain a major regulatory issue for coal combustion, and research on clean coal technology, including coal gasification and coal-to-liquid plants, is being vigorously pursued around the world, particularly in the United States. Also, research continues on possible carbon sequestration, including a Utah Geological Survey (UGS) test project within the Aneth oil field in southeastern Utah. For additional information about recent UGS sequestration research efforts, visit <http://geology.utah.gov/emp/co2sequest/>.

Production

EIA's Annual Energy Outlook for 2006 predicts that U.S. coal production will increase by an average of 1.1% each year until 2015, when total production will equal 1272 million short tons. Coal production growth should be even stronger between 2015 and 2030, averaging 2.0% per year, as electricity demand continues to increase and will most likely be met by new or expanded coal-fired power plants. Cheap, low-sulfur coal from western mines, especially Wyoming's Powder River Basin, is expected to furnish the vast majority of the production increase predicted for the country, with little change to total Appalachian and Interior region production (figure 1).

Projections for Utah coal production also show a significant increase. Operators predict a production total of 26.7 million short tons in 2006 and 29.3 million short tons in 2007, which would be a new single-year record. The majority of the increase is expected to be met as Skyline commences longwall production and Crandall and South Crandall Canyon ramp up production during retreat mining.

Other increases are expected at SUFCO, Dugout, Bear Canyon, West Ridge, and Horizon. However, there could be a dip in Utah coal production in 2008 as the Crandall Canyon mines close and as the Tower Division of ANDALEX copes with overburden issues and likely new ownership. Possibly beginning in 2009 or after, production could regain strength if the Lila Canyon or other proposed mines come online.

Prices

EIA projects that the average minemouth coal price in the United States should increase from \$21.74 per short ton in 2005 (all prices in nominal dollars) to around \$26.00 per short ton by 2015 (figure 2), equating to about an average 1.9% increase each year. This more moderate increase is expected for several reasons including improvements in mining productivity and a continuing shift to low-cost coal from Wyoming's Powder River Basin. Between 2015 and 2030, the average U.S. coal price is projected to increase by an average of 3.0% each year to about \$41.00 per short ton as predicted rising natural gas prices and the need for baseload generating capacity result in the expansion or new construction of coal-fired power plants. The average minemouth price of Western coal was \$11.12 per short ton in 2005 and is predicted to steadily increase at an average rate of 3.5% to roughly \$26.00 in 2030. In comparison, Appalachian coal is predicted to rise from \$36.67 to \$66.09 at an average rate of 2.4% per year, and Interior coal will rise from \$24.06 to \$56.24 at an average rate of 3.5% per year.

The FOB price for Utah coal decreased from \$18.47 per short ton in 2002 to \$16.64 in 2003, the lowest price in the last 30 years. Prices in 2004 increased 6.4% to \$17.70 per short ton and increased another 9.3% to \$19.34 in 2005 (table 2; figure 3). The average price of Utah coal is strongly influenced by low-priced long-term contracts; some Utah mines were selling coal in 2005 for only about \$13.00 per short ton. Conversely, current spot prices for Utah coal are as high as \$37.00 per short ton, which could exert upward pressure on the price for Utah coal in coming years. It is estimated that average Utah coal prices will increase a dramatic 16.0% to \$22.44 per short ton in 2006 and could reach \$24.00 by 2007. Also, as mining becomes more difficult and ash contents rise, washing coal might be the only option for operators to meet coal-quality standards set in their contracts. If Utah coal needs to be washed, it could add \$2.00 to \$4.00 to its delivered price. However, Utah coal will always have to compete with low-cost Powder River Basin coal, which puts downward pressure on Utah's coal price.

Distribution and Consumption

EIA projects U.S. domestic consumption of coal for all uses will total 1150 million short tons in 2006, of which 1058 million short tons, or 92.0%, will be consumed at electric utility plants. Looking ahead, U.S. consumption should increase by an average of 1.8% per year and total 1784 million short tons by 2030, with 1502 million short tons going to electric utilities (figure 4). EIA also predicts that a total of 190 million short tons will be consumed at new coal-to-liquids plants by 2030.

For 2005 and beyond, increased distribution of Utah coal

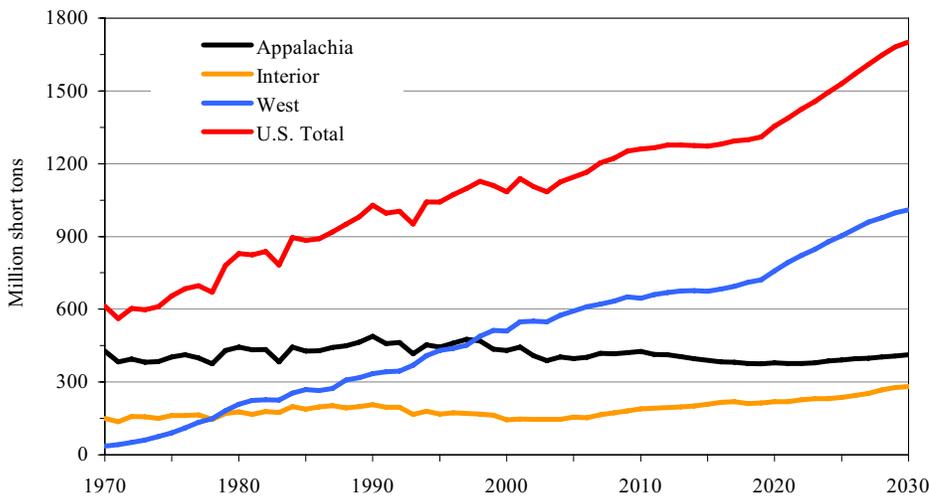


Figure 1. U.S. Coal Production by Region, 1970-2030. Source: U.S. Energy Information Administration, Annual Energy Outlook 2006. Note: Data available in appendix table A1.

Figure 2. Average U.S. Minemouth Price of Coal by Region, 1990-2030. Source: U.S. Energy Information Administration, Annual Energy Outlook 2006. Note: Data Available in appendix table A2.

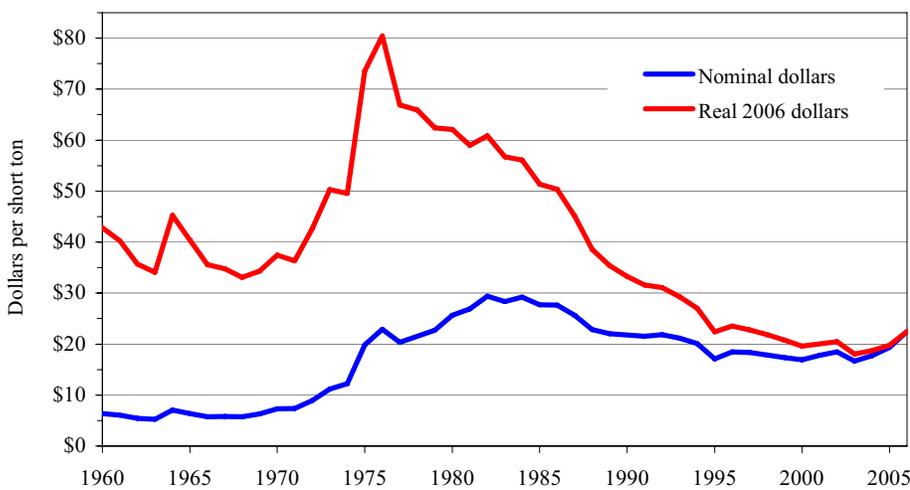
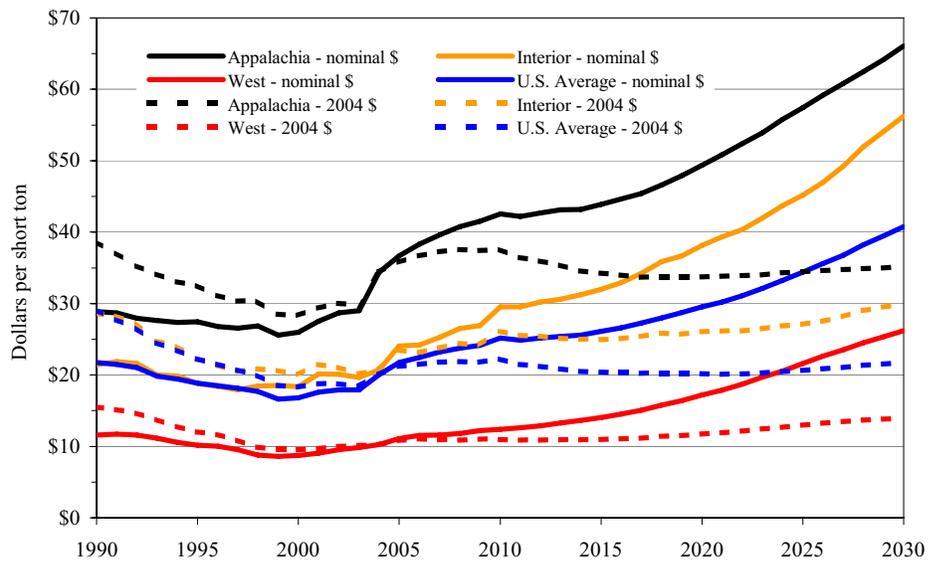


Figure 3. Average FOB Price of Utah Coal, 1960-2006. Source: UGS coal company questionnaires. Note: 2006 value is estimated, FOB - Free on board, data available in table 2.

is expected to parallel predicted production increases. For example, as production increased 12.6% in 2005, distribution of Utah coal also increased by 8.5% to 24.7 million short tons (table 7). Similar increases in both production and distribution are expected for 2006 and 2007, but with production expected to decrease slightly in 2008, distribution should follow suit.

Coal demand in Utah is expected to follow demand for electricity, which continues to increase with increases in population. Coal consumption for power generation totaled 16.4 million short tons in 2005 and accounted for 94.6% of all coal used in the state (figure 5). This total is expected to increase to 16.6 million short tons in 2006, a new single-year record. The proposed expansion of IPP, as well as the proposed new plant near Sigurd, could increase demand for Utah coal by 3.5 to 4.0 million short tons a year. Also, recent concerns about the price and availability of natural gas have dampened some enthusiasm for this relatively clean-burning

fuel. As a result, there is renewed interest in coal-burning plants as a means to increase base-load generation capacity. If Utah mines cannot meet the growing demand, plants such as IPP, which has the ability to burn lower-rank coals, may opt to import coal from places like Wyoming.

Reserves

The Kaiparowits Plateau coal field is estimated to contain about 9.1 billion short tons, or 62.7%, of Utah’s remaining recoverable coal reserves, but most of this coal is unavailable for development due to its location within the Grand Staircase-Escalante National Monument (figure 6). As a result, Utah coal production will continue to rely heavily on reserves in the Wasatch Plateau coal field, estimated at 1.3 billion short tons; the Emery coal field, estimated at 0.8 billion short tons; and the Book Cliffs coal field, with reserves estimated at 0.7 billion short tons.

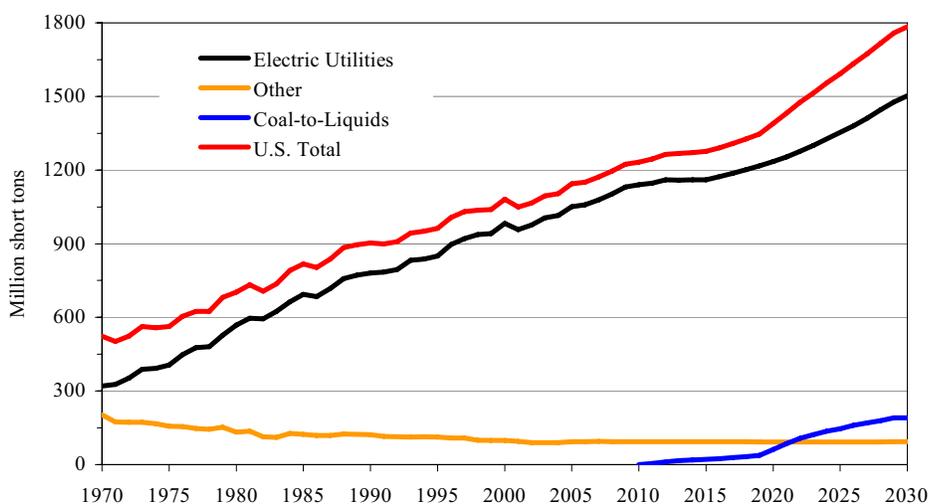


Figure 4. U.S. Coal Consumption by Sector, 1970-2030. Source: U.S. Energy Information Administration, Annual Energy Outlook 2006. Note: Data available in appendix table A3.

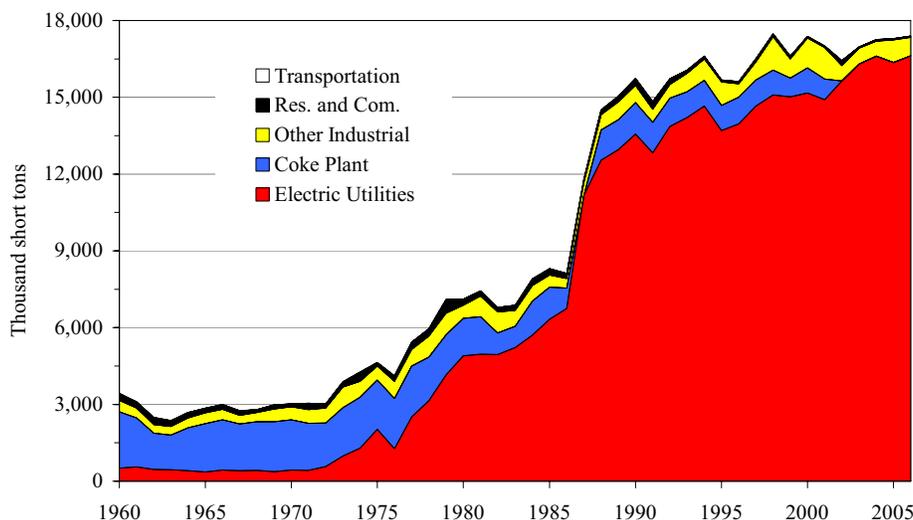


Figure 5. Consumption of Coal in Utah by End Use, 1960-2006. Source: U.S. Energy Information Administration, Annual Coal Report. UGS note: 2006 values are estimated, data available in appendix table A4.

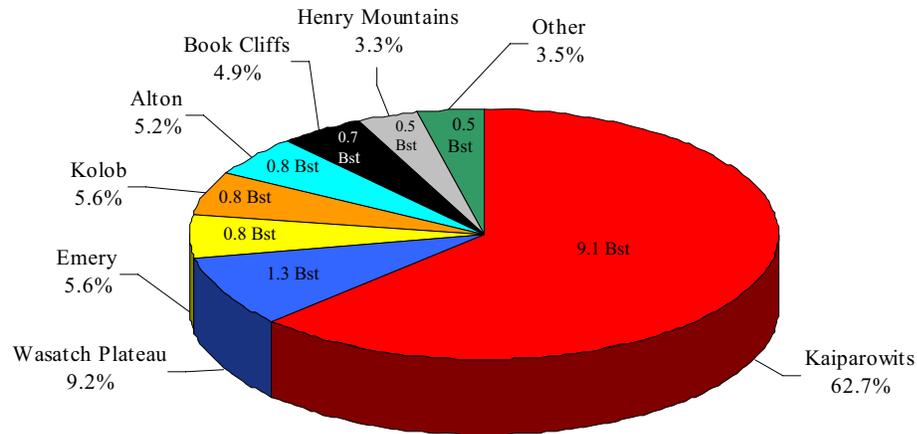


Figure 6. Remaining Recoverable Reserves in Utah by Coal Field, 2005. Source: Smith and Jahanbani, 1988; Quick and others, 2004. Note: Bst - Billion short tons, data available in appendix table A5.

Most of Utah's mining companies generally have 10 to 15 years worth of coal reserves under lease. This time frame changes little from year to year as operators are constantly applying for new leases on nearby land to replace production losses. The Cottonwood and North Horn tracts, both located in the Wasatch Plateau, may represent the last large virgin tracts of good quality, accessible coal, that are not already adjacent to an operating mine. Combined reserves in these two tracts could exceed 175 million short tons and provide 20 to 30 years of steady production for two longwall operations. In addition, large reserves exist in the southern Book Cliffs and are being pursued by UtahAmerican and Bronco coal companies. As demand for Utah coal continues to in-

crease, reserves in other coal fields may become attractive to mine. For example, the newly proposed mine in the Alton coal field could produce up to 2.0 million short tons a year from a projected reserve base of 40 to 45 million short tons.

The gradual depletion of central Utah's "easy" coal turns interest toward more difficult and/or lower-quality reserves. For example, the Emery mine in the southern portion of the Emery coal field occurs near unleased reserves that could total more than 100 million short tons, including reserves in the Hidden Valley area. These reserves, and others, may become more attractive if prices increase and coal washing becomes more economic.

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GLOSSARY

Anthracite - The highest rank of coal, used primarily for residential and commercial space heating. It is a hard, brittle, and black lustrous coal, containing a high percentage of fixed carbon and a low percentage of volatile matter. The moisture content of fresh-mined anthracite generally is less than 15%. The heat content of anthracite ranges from 11,000 to 14,000 Btu per pound.

Appalachian Region - Consists of Alabama, Eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

Ash - Impurities consisting of silica, iron, alumina, and other incombustible matter that are contained in coal. Ash increases the weight of coal, adds to the cost of handling, and can affect the burning characteristics.

Bituminous Coal - A dense coal, usually black, sometimes dark brown, often with well-defined bands of bright and dull material, used primarily as fuel in steam-electric power generation, with substantial quantities also used for heat and power applications in manufacturing and to make coke. Bituminous coal is the most abundant coal in active U.S. mining regions. Its moisture content usually is less than 20%. The heat content of bituminous coal ranges from 10,500 to 15,000 Btu per pound.

Bounce - A sudden outburst of coal and rock that occurs when stresses in a coal pillar, left for support in underground workings, causes the pillar to rupture without warning, sending coal and rock flying with explosive force.

British thermal unit (Btu) - The amount of heat needed to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Cogeneration power plant - A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, and cooling purposes. To receive status as a qualifying facility under the Public Utility Regulatory Policies Act, the facility must produce electric energy and "another form of useful thermal energy through the sequential use of energy," and meet certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission.

Coke (coal) - A solid carbonaceous residue derived from low-ash, low-sulfur bituminous coal from which the volatile constituents are driven off by baking in an oven at temperatures as high as 2,000 degrees Fahrenheit so that the fixed carbon and residual ash are fused together. Coke is used as a fuel and as a reducing agent in smelting iron ore in a blast furnace. Coke from coal is grey, hard, and porous and has a heating value of 12,400 Btu per pound.

Continuous mining - A form of room-and-pillar mining in which a continuous mining machine extracts and removes coal from the working face in one operation; no blasting is required.

Electric Utility Sector - The electric utility sector consists of privately and publicly owned establishments that generate, transmit, distribute, or sell electricity primarily for use by the public and that meet the definition of an electric utility. Nonutility power producers are not included in the electric utility sector.

Field - An area consisting of a single coal deposit or multiple deposits all grouped on, or related to, the same individual geological structural feature and/or stratigraphic condition. There may be two or more deposits in a field that are separated vertically by intervening impervious strata or laterally by local geologic barriers, or by both.

Fluidized-bed combustion - A method of burning particulate fuel, such as coal, in which the amount of air required for combustion far exceeds that found in conventional burners. The fuel particles are continually fed into a bed of mineral ash in the proportions of 1 part fuel to 200 parts ash, while a flow of air passes up through the bed, causing it to act like a turbulent fluid.

F.O.B. mine price - The free on board mine price. This is the price paid for coal at the mining operation site. It excludes freight or shipping and insurance costs.

Generator capacity - The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, adjusted for ambient conditions.

Gob - Coal leftover from underground mining in the form of cave-ins or waste piles.

Industrial Sector - The industrial sector is comprised of manufacturing industries that make up the largest part of the sector, along with mining, construction, agriculture, fisheries, and forestry. Establishments in the sector range from steel mills, to small farms, to companies assembling electronic components.

Interior Region - Consists of Arkansas, Illinois, Indiana, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, Texas, and Western Kentucky.

Longwall Mining - An automated form of underground coal mining characterized by high recovery and extraction rates, feasible only in relatively flat-lying, thick, and uniform coalbeds. A high-powered cutting machine is passed across the exposed face of coal, shearing away broken coal, which is continuously hauled away by a floor-level conveyor system. Longwall mining extracts all machine-minable coal between the floor and ceiling within a contiguous block of coal, known as a panel, leaving no support pillars within the panel area. Panel dimensions vary over time and with mining conditions but currently average about 900 feet wide (coal face width) and more than 8,000 feet long (the minable extent of the panel, measured in direction of mining). Longwall mining is done under movable roof supports that are advanced as the bed is cut. The roof in the mined-out area is allowed to fall as the mining advances.

Metallurgical Coal - Coking coal and pulverized coal consumed in making steel.

Moisture - A measure of the coal's natural inherent or bed moisture, but does not include water adhering to the surface.
Net generation - The amount of gross generation less the electrical energy consumed at the generating station(s) for station service or auxiliaries.

Nominal Price - The price paid for a product or service at the time of the transaction. The nominal price, which is expressed in current dollars, is not inflation adjusted.

Powder River Basin - Consists of the Montana counties of Big Horn, Custer, Powder River, Rosebud, and Treasure, and the Wyoming counties of Campbell, Converse, Crook, Johnson, Natrona, Niobrara, Sheridan, and Weston.

Real Price - A price that has been adjusted for inflation.

Reserves - That portion of the demonstrated reserve base that is estimated to be recoverable at the time of determination. The reserve is derived by applying a recovery factor to that component of the identified resources of coal designated as the demonstrated reserve base.

Residential and Commercial Sector - Housing units; wholesale and retail businesses (except coal wholesale dealers); health institutions (hospitals); social and educational institutions (schools and universities); and Federal, State, and local governments (military installations, prisons, office buildings).

Seam - A bed of coal lying between a roof and floor.

Spot price - The price for a one-time open market transaction for immediate delivery of a specific quantity of product at a specific location where the commodity is purchased "on the spot" at current market rates.

Subbituminous Coal - A coal whose properties range from those of lignite to those of bituminous coal and used primarily as fuel for steam-electric power generation. It may be dull, dark brown to black, soft and crumbly, at the lower end of the range, to bright, jet black, hard, and relatively strong, at the upper end. Subbituminous coal contains 20 to 30% inherent moisture by weight. The heat content of subbituminous coal ranges from 8500 to 12,000 Btu per pound.

Sulfur - One of the elements present in varying quantities in coal that contributes to environmental degradation when coal is burned.

Synfuel - Coal that has been processed by a coal synfuel plant; and coal-based fuels such as briquettes, pellets, or extrusions, which are formed by binding materials and processes that recycle material.

Waste coal - Usable coal material that is a byproduct of previous processing operations or is recaptured from what would otherwise be refuse.

Western Region - Consists of Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming.

APPENDIX

ADDITIONAL UTAH AND U.S. COAL-RELATED DATA

Table A1. U.S. Coal Production by Region, 1970-2030.

Million short tons

Year	Appalachia	Interior	West	U.S. Total	Year	Appalachia	Interior	West	U.S. Total
1970	427.6	149.9	35.1	612.6	2001	443.4	147.0	547.9	1,138.3
1971	382.3	136.3	42.3	560.9	2002	408.1	146.9	550.4	1,105.4
1972	394.4	157.5	50.6	602.5	2003	388.4	146.3	548.7	1,083.4
1973	381.6	156.4	60.5	598.5	2004	403.2	146.3	575.2	1,124.6
1974	384.3	150.2	75.5	610.0	2005	397.3	155.1	592.7	1,145.1
1975	402.7	162.1	89.8	654.6	2006	401.8	153.2	610.6	1,165.7
1976	412.4	162.0	110.6	685.0	2007	418.2	165.3	620.3	1,203.8
1977	399.7	163.8	133.8	697.3	2008	416.2	173.6	633.0	1,222.8
1978	374.9	146.2	149.0	670.1	2009	420.7	180.7	650.9	1,252.4
1979	429.5	170.2	181.4	781.1	2010	426.1	189.9	644.9	1,260.9
1980	444.3	176.3	209.1	829.7	2011	413.5	192.2	660.1	1,265.9
1981	433.0	166.6	224.1	823.7	2012	412.5	195.2	669.3	1,277.1
1982	433.2	178.2	226.8	838.2	2013	404.1	197.0	675.4	1,276.5
1983	383.1	173.7	225.3	782.1	2014	396.2	200.9	677.0	1,274.2
1984	444.0	198.0	253.8	895.8	2015	389.2	208.9	674.1	1,272.2
1985	427.2	187.8	268.7	883.7	2016	382.7	216.0	682.7	1,281.4
1986	428.5	196.6	265.2	890.3	2017	381.5	218.7	694.2	1,294.3
1987	443.3	201.7	273.8	918.8	2018	376.6	211.5	710.7	1,298.8
1988	449.4	193.0	307.9	950.3	2019	375.9	213.5	721.3	1,310.7
1989	464.5	197.9	318.4	980.8	2020	378.9	218.5	757.8	1,355.2
1990	489.0	205.7	334.4	1,029.1	2021	376.8	219.0	792.4	1,388.2
1991	457.8	195.4	342.8	996.0	2022	376.7	226.6	821.3	1,424.6
1992	462.6	195.7	345.3	1,003.5	2023	379.4	231.0	846.8	1,457.2
1993	416.1	167.2	368.5	951.8	2024	386.2	231.4	877.6	1,495.2
1994	453.3	179.9	408.3	1,041.4	2025	390.5	236.1	903.6	1,530.2
1995	443.4	168.5	429.6	1,041.5	2026	395.4	244.4	931.3	1,571.1
1996	460.7	172.8	439.1	1,072.7	2027	397.6	252.7	959.1	1,609.4
1997	475.9	170.9	451.3	1,098.0	2028	403.4	266.9	976.8	1,647.0
1998	469.4	168.4	488.8	1,126.5	2029	406.9	277.4	997.3	1,681.7
1999	435.2	162.5	512.3	1,110.0	2030	412.0	280.8	1,009.9	1,702.7
2000	429.5	143.5	510.7	1,083.7					

Source: U.S. Energy Information Administration, Annual Energy Outlook, 2006

Note: 2005 total is forecast, hence it does not match the actual 2005 total recorded in table 1

Table A2. Average U.S. Minemouth Price of Coal by Region, 1990-2030.

Year	Appalachia		Interior		West		U.S. Average	
	Nominal dollars	Real 2004 dollars						
1990	28.89	38.62	21.45	28.67	11.60	15.51	21.76	29.09
1991	28.69	37.06	21.86	28.24	11.71	15.13	21.49	27.76
1992	27.94	35.29	21.61	27.29	11.60	14.65	21.03	26.56
1993	27.64	34.12	20.03	24.72	11.14	13.75	19.85	24.50
1994	27.36	33.07	19.87	24.02	10.57	12.78	19.41	23.46
1995	27.45	32.51	18.81	22.28	10.15	12.02	18.83	22.30
1996	26.79	31.13	18.41	21.40	10.03	11.66	18.50	21.50
1997	26.55	30.36	17.91	20.48	9.52	10.89	18.14	20.74
1998	26.85	30.36	18.45	20.86	8.76	9.91	17.67	19.98
1999	25.58	28.52	18.52	20.65	8.59	9.58	16.63	18.54
2000	25.99	28.36	18.37	20.04	8.72	9.52	16.78	18.31
2001	27.55	29.35	20.14	21.46	9.06	9.65	17.59	18.74
2002	28.68	30.03	20.12	21.06	9.55	10.00	17.90	18.74
2003	29.02	29.78	19.65	20.16	9.84	10.10	17.93	18.40
2004	34.41	34.41	20.71	20.71	10.26	10.26	20.07	20.07
2005	36.67	35.76	24.06	23.46	11.12	10.84	21.74	21.20
2006	38.32	36.65	24.20	23.14	11.55	11.05	22.44	21.46
2007	39.62	37.23	25.27	23.75	11.60	10.90	23.21	21.81
2008	40.78	37.55	26.50	24.40	11.79	10.86	23.75	21.87
2009	41.51	37.44	26.90	24.26	12.21	11.01	24.17	21.80
2010	42.53	37.58	29.55	26.11	12.39	10.95	25.16	22.23
2011	42.21	36.44	29.56	25.52	12.62	10.89	24.86	21.46
2012	42.71	35.94	30.23	25.44	12.89	10.85	25.18	21.19
2013	43.12	35.38	30.60	25.11	13.29	10.90	25.40	20.84
2014	43.20	34.57	31.24	25.00	13.62	10.90	25.59	20.48
2015	43.90	34.27	31.97	24.96	14.05	10.97	26.12	20.39
2016	44.62	33.98	32.94	25.08	14.54	11.07	26.62	20.27
2017	45.43	33.69	34.23	25.39	15.05	11.16	27.25	20.21
2018	46.61	33.62	35.85	25.86	15.79	11.39	27.99	20.19
2019	47.92	33.64	36.65	25.73	16.39	11.51	28.73	20.17
2020	49.39	33.75	38.12	26.05	17.18	11.74	29.56	20.20
2021	50.84	33.82	39.34	26.17	17.86	11.88	30.20	20.09
2022	52.39	33.93	40.39	26.16	18.73	12.13	31.08	20.13
2023	53.89	34.01	41.96	26.48	19.70	12.43	32.12	20.27
2024	55.77	34.31	43.71	26.89	20.56	12.65	33.24	20.45
2025	57.43	34.46	45.16	27.10	21.61	12.97	34.38	20.63
2026	59.16	34.64	46.98	27.51	22.63	13.25	35.61	20.85
2027	60.82	34.76	49.24	28.14	23.53	13.45	36.78	21.02
2028	62.49	34.88	51.94	28.99	24.51	13.68	38.25	21.35
2029	64.16	34.99	54.09	29.50	25.34	13.82	39.48	21.53
2030	66.09	35.21	56.24	29.96	26.19	13.95	40.79	21.73

Source: U.S. Energy Information Administration, Annual Energy Outlook 2006

Table A3. U.S. Coal Consumption by Sector, 1970-2030.

Million short tons

Year	Electric Utilities	Other	Coal-to-Liquids	U.S. Total	Year	Electric Utilities	Other	Coal-to-Liquids	U.S. Total
1970	320	203	--	523	2001	957	94	--	1,050
1971	327	174	--	502	2002	976	90	--	1,066
1972	352	173	--	524	2003	1,005	90	--	1,095
1973	389	173	--	563	2004	1,015	89	--	1,104
1974	392	167	--	558	2005	1,051	93	--	1,144
1975	406	157	--	563	2006	1,058	93	--	1,150
1976	448	155	--	604	2007	1,078	94	--	1,172
1977	477	148	--	625	2008	1,103	93	--	1,196
1978	481	144	--	625	2009	1,131	93	--	1,224
1979	527	153	--	681	2010	1,140	93	--	1,233
1980	569	133	--	703	2011	1,146	93	5	1,245
1981	597	136	--	733	2012	1,160	93	11	1,264
1982	594	113	--	707	2013	1,159	93	16	1,268
1983	625	111	--	737	2014	1,160	93	19	1,272
1984	664	127	--	791	2015	1,161	93	22	1,276
1985	694	124	--	818	2016	1,173	93	24	1,290
1986	685	119	--	804	2017	1,187	93	29	1,308
1987	718	119	--	837	2018	1,202	93	33	1,327
1988	758	125	--	884	2019	1,217	92	38	1,347
1989	772	123	--	895	2020	1,235	92	62	1,390
1990	781	122	--	903	2021	1,254	92	86	1,432
1991	784	115	--	899	2022	1,277	92	107	1,476
1992	795	113	--	908	2023	1,300	92	122	1,514
1993	832	112	--	944	2024	1,327	92	136	1,555
1994	838	113	--	951	2025	1,354	92	146	1,592
1995	850	112	--	962	2026	1,380	92	160	1,633
1996	897	109	--	1,006	2027	1,412	92	170	1,674
1997	921	109	--	1,030	2028	1,445	92	179	1,717
1998	937	100	--	1,037	2029	1,477	93	190	1,759
1999	941	98	--	1,039	2030	1,502	93	190	1,784
2000	983	98	--	1,081					

Source: U.S. Energy Information Administration, Annual Energy Outlook 2006

Table A4. Consumption of Coal in Utah by End Use, 1960-2006.

Thousand Short Tons

Year	Electric Utilities ¹	Coke Plant	Other Industrial	Residential & Commercial	Transportation	Total
1960	515	2,195	445	249	45	3,449
1961	563	1,910	383	243	10	3,110
1962	462	1,414	338	275	7	2,497
1963	447	1,351	342	228	6	2,374
1964	411	1,676	392	204	8	2,690
1965	363	1,892	414	181	8	2,857
1966	440	1,961	409	185	7	3,003
1967	410	1,829	330	180	5	2,753
1968	417	1,903	359	119	5	2,803
1969	375	1,951	496	161	4	2,988
1970	435	1,959	518	109	4	3,025
1971	417	1,841	545	240	3	3,047
1972	571	1,705	586	161	2	3,024
1973	984	1,890	811	199	2	3,886
1974	1,296	1,984	627	355	1	4,263
1975	2,026	1,932	546	131	0	4,636
1976	1,267	1,959	683	208	0	4,117
1977	2,511	1,991	644	282	0	5,429
1978	3,148	1,700	826	281	0	5,954
1979	4,151	1,569	842	542	0	7,104
1980	4,895	1,473	501	237	0	7,106
1981	4,956	1,477	804	196	0	7,432
1982	4,947	845	818	177	0	6,787
1983	5,223	831	627	191	0	6,873
1984	5,712	1,326	608	259	0	7,905
1985	6,325	1,254	472	252	0	8,303
1986	6,756	785	380	191	0	8,112
1987	11,175	0	507	124	0	11,807
1988	12,544	1,176	597	196	0	14,513
1989	12,949	1,178	686	231	0	15,044
1990	13,563	1,231	676	267	0	15,738
1991	12,829	1,192	508	305	0	14,834
1992	13,857	1,114	525	223	0	15,719
1993	14,210	1,005	727	121	0	16,063
1994	14,656	1,007	835	105	0	16,603
1995	13,693	990	915	77	0	15,675
1996	13,963	1,047	512	94	0	15,615
1997	14,654	1,020	709	123	0	16,507
1998	15,094	971	1,304	113	0	17,482
1999	15,011	741	744	114	0	16,611
2000	15,164	984	1,166	59	0	17,373
2001	14,906	806	1,235	60	0	17,006
2002	15,644	0	592	198	0	16,434
2003	16,302	0	611	61	0	16,975
2004	16,606	0	583	61	0	17,250
2005	16,363	0	875	55	0	17,293
2006*	16,625	0	713	58	0	17,396

Source: U.S. Energy Information Administration, Annual Coal Report, and UGS

Note: Consumption differs from distribution (table 7) because of additional consumption from consumer stockpiles.

¹Includes waste coal burned at Sunnyside Cogeneration

*Forecast

Table A5. Utah Coal Reserves by Coal Field, 2005.

Million Short Tons

Coal Field	Original Principal Reserves	Original Recoverable Reserves	Cumulative Production 1870-2005	Remaining Recoverable Reserves	% of Remaining Recoverable Reserves
Kaiparowits	22,740.0	9,096.0	0.1	9,095.9	62.7%
Wasatch Plateau	6,378.9	1,913.7	586.7	1,327.0	9.2%
Emery	2,336.0	817.6	11.3	806.3	5.6%
Kolob	2,014.3	805.9	0.9	805.0	5.6%
Alton	1,509.4	754.7	0.0	754.7	5.2%
Book Cliffs	3,527.3	1,033.5	323.3	710.2	4.9%
Henry Mountains	925.5	484.7	0.0	484.7	3.3%
Sego	696.3	208.9	2.7	206.2	1.4%
Mt. Pleasant	249.1	99.6	0.0	99.6	0.7%
Tabby Mountain	231.7	69.4	0.0	69.4	0.5%
Vernal	177.1	53.2	0.5	52.7	0.4%
Coalville	186.0	55.8	4.3	51.5	0.4%
Salina Canyon	86.4	30.2	0.5	29.7	0.2%
Wales	12.2	3.7	0.8	2.9	*
Harmony	1.3	0.4	0.0	0.4	*
Lost Creek	1.1	0.4	0.0	0.4	*
Sterling	2.0	0.6	0.3	0.3	*
Total	41,074.6	15,428.3	931.4	14,496.9	

Source: Smith and Jahanbani, 1988; Quick and others, 2004; production data from UGS coal company questionnaires

* Value less than 0.1%

Table A6. Utah Coal Reserves by County, 2005.

Million Short Tons

County	Original Principal Reserves	Original Recoverable Reserves	Cumulative Production 1870-2005	Remaining Recoverable Reserves	% of Remaining Recoverable Reserves
Kane	18,934.0	7,724.6	0.1	7,724.5	53.3%
Garfield	7,493.1	3,106.3	0.0	3,106.3	21.4%
Carbon	4,993.6	1,475.8	443.0	1,032.8	7.1%
Emery	4,457.7	1,392.9	361.8	1,031.1	7.1%
Sevier	2,651.1	858.5	117.8	740.7	5.1%
Iron	650.8	260.2	0.8	259.4	1.8%
Grand	696.3	208.9	2.7	206.2	1.4%
Sanpete	489.5	171.8	0.7	171.1	1.2%
Wasatch	177.3	53.2	0.0	53.2	0.4%
Uintah	177.1	53.2	0.3	52.9	0.4%
Summit	186.0	55.8	4.3	51.5	0.4%
Washington	86.1	34.4	0.0	34.4	0.2%
Duchesne	53.9	16.2	0.0	16.2	0.1%
Wayne	27.0	16.2	0.0	16.2	0.1%
Morgan	1.1	0.4	0.0	0.4	*
Total	41,074.6	15,428.3	931.4	14,496.9	

Source: Smith and Jahanbani, 1988; Quick and others, 2004; production data from UGS coal company questionnaires

* Value less than 0.1%

Table A7. Electricity Generation and Coal Consumption at Coal Burning Power Plants in Utah, 1990-2006.

Year	Deseret Generation & Transmission Co.				Intermountain Power Agency				PacifiCorp				PacifiCorp			
	Bonanza				Intermountain (IPP)				Carbon				Hunter			
	Consumption	Net Generation	MWh per Short Ton		Consumption	Net Generation	MWh per Short Ton		Consumption	Net Generation	MWh per Short Ton		Consumption	Net Generation	MWh per Short Ton	
Short Tons	MWh			Short Tons	MWh			Short Tons	MWh			Short Tons	MWh			
1990	1,237,312	2,577,271	2.08	4,967,883	12,410,005	2.50	582,320	1,260,497	2.16	4,022,009	9,019,470	2.24				
1991	1,309,770	2,764,208	2.11	4,145,585	10,106,144	2.44	547,905	1,192,091	2.18	4,124,260	8,915,149	2.16				
1992	1,511,878	3,201,401	2.12	4,959,568	12,264,308	2.47	623,178	1,307,598	2.10	4,107,391	8,605,835	2.10				
1993	1,414,980	3,132,999	2.21	4,856,527	11,936,833	2.46	631,909	1,358,949	2.15	4,253,731	9,151,459	2.15				
1994	1,533,363	3,242,413	2.11	4,916,555	12,171,664	2.48	622,621	1,366,103	2.19	4,277,130	9,323,744	2.18				
1995	1,125,003	2,344,439	2.08	4,248,623	10,306,059	2.43	605,712	1,351,984	2.23	4,376,632	9,453,500	2.16				
1996	1,341,076	2,831,105	2.11	4,350,752	10,711,308	2.46	622,126	1,410,369	2.27	4,343,571	9,337,663	2.15				
1997	1,532,158	2,947,675	1.92	5,158,831	12,762,721	2.47	653,833	1,403,936	2.15	4,220,568	8,893,113	2.11				
1998	1,734,613	3,456,787	1.99	5,278,344	12,973,101	2.46	600,317	1,286,805	2.14	4,140,205	9,044,084	2.18				
1999	1,598,296	3,227,344	2.02	5,266,047	13,069,535	2.48	552,590	1,217,838	2.20	4,220,721	9,483,957	2.25				
2000	1,510,407	2,931,869	1.94	5,301,096	13,176,578	2.49	628,623	1,371,586	2.18	4,226,218	9,518,367	2.25				
2001	2,013,770	3,932,642	1.95	5,365,021	13,383,601	2.49	632,124	1,371,822	2.17	3,722,062	8,289,465	2.23				
2002	2,092,485	3,921,576	1.87	5,429,620	13,479,234	2.48	612,536	1,322,047	2.16	4,327,402	9,393,626	2.17				
2003	1,893,338	3,512,734	1.86	5,518,129	13,554,882	2.46	657,111	1,369,884	2.08	4,563,686	9,934,622	2.18				
2004	1,996,868	3,734,811	1.87	5,996,797	14,435,000	2.41	556,458	1,133,139	2.04	4,668,586	9,957,531	2.13				
2005	1,979,718	3,716,487	1.88	5,689,688	13,664,259	2.40	673,000	1,349,858	2.01	4,613,000	9,742,633	2.11				
2006*	1,956,641	3,397,198	1.74	6,000,000	14,279,000	2.38	600,000	1,296,967	2.16	4,709,000	10,232,161	2.17				

Year	PacifiCorp				Sunnyside Cogeneration Plant				Total			
	Huntington				Waste Coal				Consumption			
	Consumption	Net Generation	MWh per Short Ton		Consumption	Net Generation	MWh per Short Ton		Short Tons	MWh	Short Tons	MWh per Short Ton
1990	2,753,717	6,253,702	2.27	--	--	--	--	13,563,241	31,520,945	2.32		
1991	2,701,376	5,907,238	2.19	--	--	--	--	12,828,896	28,884,830	2.25		
1992	2,655,409	6,164,281	2.32	--	--	--	--	13,857,424	31,543,423	2.28		
1993	2,837,819	6,339,069	2.23	214,580	184,187	0.86	14,209,546	32,103,496	2.26			
1994	2,919,715	6,660,541	2.28	386,800	348,287	0.90	14,656,184	33,112,752	2.26			
1995	2,968,886	6,803,932	2.29	368,550	332,194	0.90	13,693,406	30,592,108	2.23			
1996	2,927,155	6,402,742	2.19	378,230	392,483	1.04	13,962,910	31,085,670	2.23			
1997	2,686,976	6,136,491	2.28	402,040	385,829	0.96	14,654,406	32,529,765	2.22			
1998	2,910,474	6,445,954	2.21	430,000	376,057	0.87	15,093,953	33,582,788	2.22			
1999	2,952,484	7,126,340	2.41	421,230	398,945	0.95	15,011,368	34,523,959	2.30			
2000	3,021,448	7,047,404	2.33	476,170	430,408	0.90	15,163,962	34,476,212	2.27			
2001	2,670,253	6,226,810	2.33	502,490	387,382	0.77	14,905,720	33,591,722	2.25			
2002	2,686,747	5,964,496	2.22	494,715	390,985	0.79	15,643,505	34,471,964	2.20			
2003	3,155,334	7,207,036	2.28	514,564	399,490	0.78	16,302,162	35,978,648	2.21			
2004	2,878,761	6,379,605	2.22	508,950	395,307	0.78	16,606,420	36,029,681	2.17			
2005	2,920,000	6,381,332	2.19	487,854	471,735	0.97	16,363,260	35,326,304	2.16			
2006*	2,823,000	6,344,020	2.25	489,264	462,933	0.95	16,624,905	36,507,996	2.20			

Source: UGS coal company questionnaires

*Forecast

Table A8. Average Coal Quality at Utah Mines, 2005.

Company	Mine	Coal Field	Seam(s)	Heat Content	% Sulfur	% Ash	% Moisture
				Btu/lb			
ANDALEX Resources Inc.	Aberdeen/Pinnacle	Book Cliffs	Aberdeen/Centennial	12,200	0.5%	8.5%	6.5%
Canyon Fuel Co.	Dugout Canyon	Book Cliffs	Gilson	12,058	0.5%	10.4%	6.6%
WEST RIDGE Resources	West Ridge	Book Cliffs	Lower Sunnyside	13,052	1.4%	9.6%	6.1%
Consolidation Coal Co.	Emery	Emery	I	12,000	1.0%	10.0%	7.0%
Canyon Fuel Co.	Skyline #3	Wasatch	Lower O'Connor 'A'	11,680	0.5%	9.0%	8.7%
Canyon Fuel Co.	SUFCO	Wasatch	Upper Hiawatha	11,243	0.4%	9.2%	10.3%
Co-op Mining Co.	Bear Canyon #3	Wasatch	Tank/Blind Canyon	11,900	0.7%	12.0%	7.0%
Energy West Mining Co.	Deer Creek	Wasatch	Hiawatha/Blind Canyon	11,500	0.6%	12.0%	8.0%
GENWAL Resources Inc.	Crandall Canyon and South C.C.	Wasatch	Hiawatha/Blind Canyon	11,305	0.6%	14.2%	8.6%
Hidden Splendor Resources Inc.	Horizon	Wasatch	Hiawatha	11,700	0.6%	10.0%	5.0%

Source: UGS coal company questionnaires

Table A9. Coalbed Methane Proved Reserves and Production in Utah and the U.S., 1985-2005.

Million Cubic Feet

Year	Reserves in Utah ¹	Reserves in U.S. ¹	Production in Utah ²			Production in U.S. ¹
			Carbon County	Emery County	Total	
1985	na	na	0	0	0	na
1986	na	na	0	0	0	na
1987	na	na	9	0	9	na
1988	na	na	37	0	37	na
1989	na	3,676,000	0	0	0	91,000
1990	na	5,087,000	0	0	0	196,000
1991	na	8,163,000	76	0	76	348,000
1992	na	10,034,000	156	0	156	539,000
1993	na	10,184,000	905	0	905	752,000
1994	na	9,712,000	4,681	0	4,681	851,000
1995	na	10,499,000	12,206	1	12,207	956,000
1996	na	10,566,000	16,718	221	16,939	1,003,000
1997	na	11,462,000	22,528	356	22,883	1,090,000
1998	na	12,179,000	31,750	799	32,549	1,194,000
1999	na	13,229,000	49,819	1,840	51,659	1,252,000
2000	1,592,000	15,708,000	71,990	3,602	75,591	1,379,000
2001	1,685,000	17,531,000	85,683	7,360	93,043	1,562,000
2002	1,725,000	18,491,000	88,753	13,422	102,174	1,614,000
2003	1,224,000	18,743,000	81,060	16,650	97,710	1,600,000
2004	934,000	18,390,000	72,627	16,709	89,336	1,720,000
2005	na	na	66,050	15,911	81,961	na

Source: ¹U.S. Energy Information Administration, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 2004²Utah Division of Oil, Gas and Mining

Note: Coalbed methane wells are classified as gas wells in the state of Utah. The production shown above is included in the state's published gas production volumes.

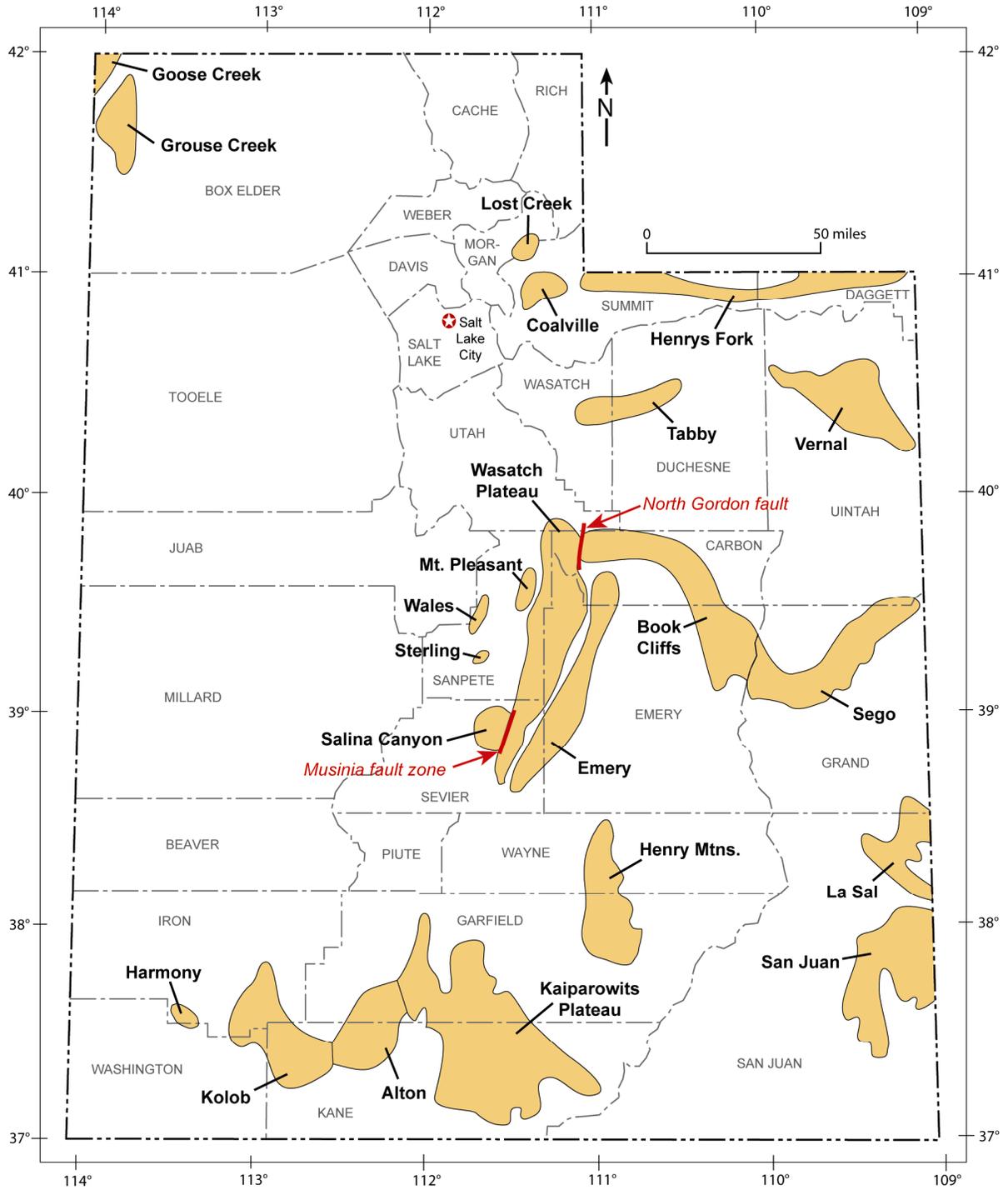


Figure A1. Location of Utah coal fields. Source: UGS

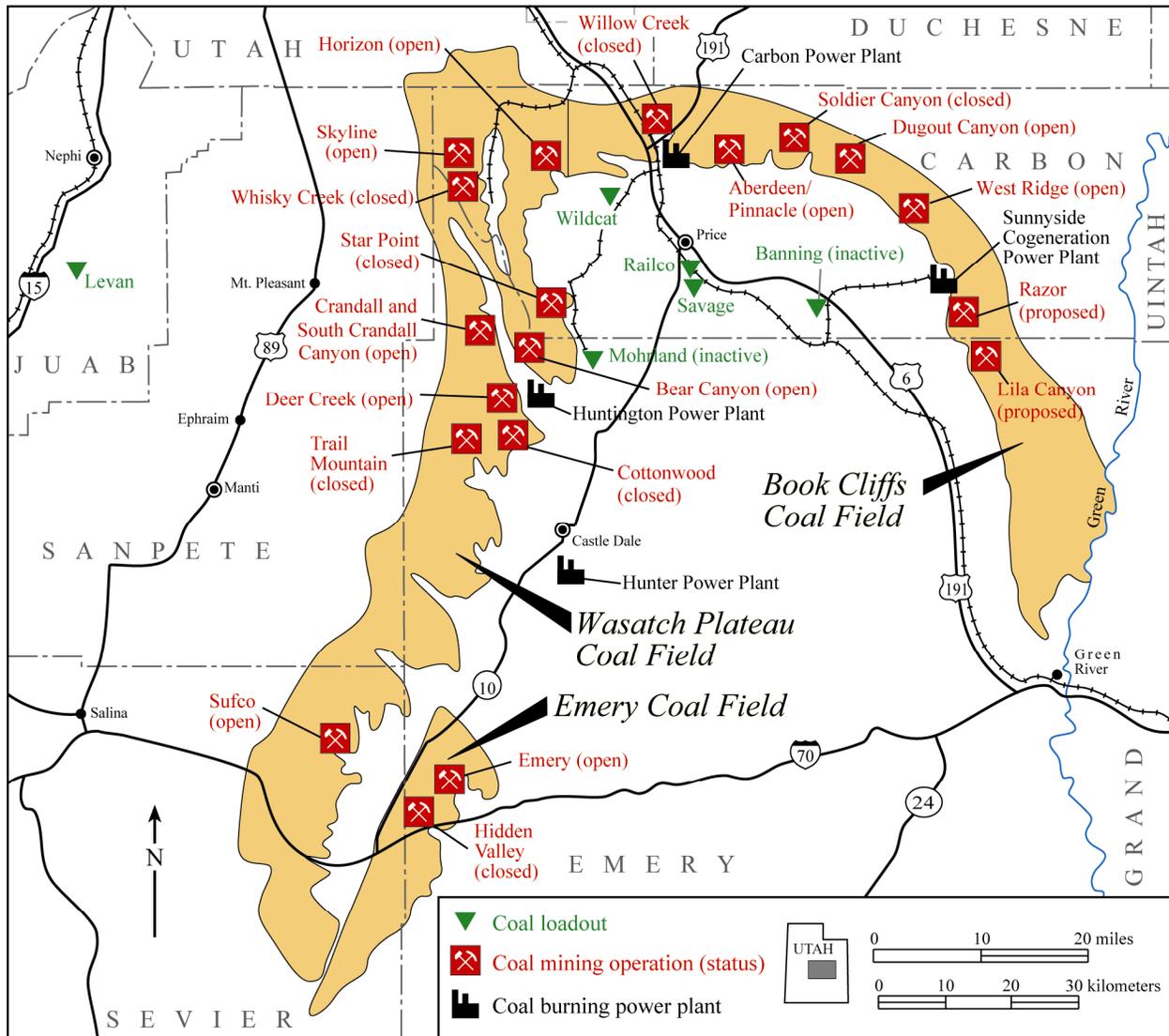


Figure A2. Location and status (at time of printing) of Utah coal mining operations. Source: UGS