

17. Energy

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2018 Overview

Utah's energy landscape is undergoing significant changes, some of which are related to worldwide trends, while others are more Utah or western U.S. specific. The more noteworthy changes include: 1) the partial rebound in crude oil prices after the 2015 crash and the subsequent increase in Utah crude oil production; 2) the continued low natural gas price, which directly affects exploration in Utah; 3) the exponential increase in residential rooftop solar capacity, along with implementation of energy efficiency measures, which have changed Utah's electricity demand growth; and 4) the reduction in coal-fired power generation in Utah and related reduction in coal demand due to an increase in renewable and natural gas-generated electricity.

Utah's crude oil price dropped from a high of about \$100 per barrel in the summer of 2014 to a low of about \$20 a barrel in early 2016, but has subsequently rebounded to about \$60 per barrel in 2018. After two years of decline (2014 to 2016), crude oil production increased in 2017 by 13 percent and again in 2018 by 7 percent as a result of stronger prices. In contrast, natural gas prices have remained low for the past four years due to oversupply from the country's prolific shale reservoirs. As a result, drilling for gas in Utah has virtually stopped and production has declined by 40 percent since the peak reached in 2012. Between 2015 and 2017, 855 megawatts (MW) of new utility-scale solar capacity came online in Utah, more capacity than wind, hydroelectric, geothermal, and biomass combined. This surge in solar also occurred in the residential sector—the total installed residential PV capacity in Utah has increased from just 6 MW in late 2013 to 177 MW in late 2018.

Coal production in Utah is near a 30-year low as out-of-state demand, especially from Nevada and California, dramatically declined as coal plants shut-down or convert to natural gas. Production of electricity in Utah has decreased significantly in the past 10 years (down 17 percent), mostly from coal-

fired power plants (down 33 percent overall and currently accounting for 65 percent of total), while natural gas-fired power plants (21 percent of total) and renewable resources (13 percent of total) have greatly increased their share of total generation. Consumption of petroleum products is expected to reach record levels in 2018 as prices remain relatively low, and consumption of natural gas is also expected to increase. Electricity consumption has grown at a modest 0.6 percent per year for the past five years, in contrast to the historical 3–4 percent annual growth rate. This reduction in growth is partially attributed to the increase in rooftop solar installations, which offsets electric demand from power plants, but more significant is an increase in implementation of energy efficiency measures. Utah will continue to be a net-exporter of energy by producing more natural gas, coal, and electricity than is used in-state, but will remain reliant on other states and Canada to satisfy our demand for crude oil and petroleum products.

Petroleum

Production. From 2003 to 2014, crude oil production in Utah experienced a substantial resurgence due to new discoveries in central Utah and increased exploration and development in the Uinta Basin—the latter fueled by dramatic increases in crude oil prices over those years as well as the advancement of horizontal drilling. Crude oil production reached 40.9 million barrels in 2014, over triple the production achieved in 2003. Following a large decline in the price of crude oil, production dropped 9.2 percent in 2015 to 37.1 million barrels and dropped an additional 18 percent in 2016 to 30.5 million barrels. However, as prices increased in the past few years, crude oil production followed, reaching 34.5 million barrels in 2017 and estimated to reach 36.8 million barrels in 2018. Total crude oil pipeline imports increased to 40.3 million barrels in 2016, making up for declining Utah production coupled with increases in refinery capacity, but declined to 36.9 million barrels in 2017 and 35.9 million barrels in 2018 as Utah production increased

by about 6 million barrels. Refinery receipts—the amount of crude oil delivered to Utah’s five refineries—reached a record high of 67.3 million barrels in 2017 as refineries increased their capacity by about 9 percent, but retreated to 65 million barrels in 2018, partly due to a fire at the Holly refinery that reduced capacity for a time. Estimated exports of Utah crude oil peaked in 2014 at 15 million barrels, coinciding with a peak in production. After dropping to 4 million barrels in 2017 due to lower production rates and record refinery receipts, exports are estimated to increase to nearly 8 million barrels in 2018.

Prices and Value. Following worldwide trends, Utah’s crude oil price began to decline in late 2014 (from about \$85 per barrel) and continued to decline through much of 2015 (down to a low of about \$28 per barrel). It averaged \$36.92 in 2016, a price not seen since 2003. Prices steadily increased through 2017 and into early 2018, stabilizing near \$60 a barrel for most of the year, but have begun to decline again in late 2018 (down to about \$50 a barrel), resulting in an estimated average price for 2018 of \$57 per barrel. The overall increase in price, coupled with a resultant increase in production, pushed the value of Utah’s produced crude oil to \$2.1 billion in 2018, the highest in the last four years, but only two-thirds of the record value of \$3.2 billion set in 2014. Following suit, Utah’s average price for regular unleaded motor gasoline and diesel also increased in 2018 to \$2.84 and \$3.24 per gallon, respectively.

Consumption. Utah’s refined petroleum production increased to a record 78.5 million barrels in 2017 as a result of several refinery capacity expansions, but retreated in 2018 to 75.3 million barrels. Refined petroleum product imports from Wyoming via the Pioneer pipeline increased slightly to 15.8 million barrels in 2018, and Utah refineries were able to export 31.7 million barrels of petroleum products via pipeline to other states. As demand increases due to a growing economy and increased population, Utah’s total petroleum product consumption is estimated to increase to a new high of 57.1 million barrels in 2018, the largest

share of which is motor gasoline (51 percent) followed by diesel fuel (26 percent).

Natural Gas

Production. Utah’s natural gas production peaked in 2012 at 491 billion cubic feet (Bcf) but has since retreated to 295 Bcf in 2018, the lowest in the past 15 years, as prices have softened. Dry production and actual natural gas sales also decreased to 285 and 257 Bcf, respectively. Similarly, natural gas liquids production decreased to about 4 million barrels. Nearly all of Utah’s natural gas production comes from conventional reservoirs; only a few unconventional shale gas exploratory wells have been drilled, all before the price declined in 2015. With the current low price of natural gas, drilling rigs in Utah are focused solely on liquid-rich plays.

Prices and Value. The average wellhead price for natural gas in Utah decreased 49 percent between 2014 and 2016 (from \$4.35 per thousand cubic feet [Mcf] to \$2.24 per Mcf) but rebounded by 21 percent to \$2.72 per Mcf in 2017 and increased again in 2018 to \$2.80. Unfortunately, prices in the \$2 range are not conducive to any new natural gas exploration or development. In contrast to the 2018 decrease in wellhead price, the residential natural gas price increased 7.2 percent to \$9.70 per Mcf. The lower overall production of both natural gas and natural gas liquids, coupled with the steady low prices, resulted in a 2018 value of natural gas production of \$970 million.

Consumption. Natural gas consumption in Utah has been volatile over the past few years, mostly due to large swings in the electric utility market. Overall consumption increased by 7.5 percent in 2018 to 239 Bcf, which includes a significant 44 percent increase in consumption at Utah’s natural gas power plants. In contrast, consumption from the residential, commercial, and industrial sectors stayed mostly steady. Utah consumes only about 81 percent of in-state production, making Utah a net exporter of natural gas.

Coal

Production. Utah coal production is expected to decrease 1.5 percent in 2018 to 14.2 million short tons, well below the 24.5 million tons averaged in the 2000s. Declining Utah coal production started

during the 2008 recession, but demand has not rebounded like other energy commodities since coal has dropped out of favor as a fuel for electric and industrial needs. Production at the three Wolverine (formerly Bowie) mines—Skyline, Dugout, and Sufco—decreased about 1.5 million tons in 2018 but still accounted for 68 percent of Utah’s total coal production. The Murray-owned West Ridge mine shut down in late 2015 and the longwall mining machine was shifted to the Lila Canyon mine, which has since ramped up production to 2.6 million tons and has capacity to produce more if market conditions improve. The Deer Creek mine closed in early 2015, while the nearby Castle Valley mine has kept steady production of about 1 million tons per year. The Coal Hollow mine in southern Utah will produce roughly 600,000 tons in 2018 from their surface mine on private land. The BLM recently completed an environmental impact statement for federal land in the Alton coal field, which could soon come up for lease. Bronco Energy recently reopened the Emery mine, cutting new portals in spring 2017, and produced about 400,000 tons in 2018, with possibilities to produce more if customers can be found.

Prices and Value. The average mine-mouth price for Utah coal decreased 3.6 percent in 2018 to about \$34 per short ton, still a relatively high price in nominal dollars but well below the inflation-adjusted high of \$99 per ton reached in 1976. Recent price declines are mostly related to the decrease in domestic demand. The end-use price of coal at Utah electric utilities, which includes transportation costs, increased slightly to \$44 per ton in 2018. The value of coal produced in Utah totaled \$483 million in 2018, the lowest nominal value since 2005 and well below the inflation-adjusted high of \$1.3 billion recorded in 1982.

Consumption. Approximately 13 million short tons of coal were consumed in Utah in 2018, 96 percent of which was burned at electric utilities. Demand for coal in Utah has remained steady in recent years after a dramatic 17 percent decline between 2015 and 2016. Coke consumption in Utah ended in 2002 when Geneva Steel went out of business, and coal sales for industrial use (mostly cement and lime companies) have dropped to roughly 500,000 tons

per year, which is less than half of the peak demand of 1.3 million tons reached in 1998. In the past, Utah was a significant net exporter of coal, but out-of-state domestic demand has dropped from a high of 16 million tons in 2001 to only about 1.8 million tons in 2018. Utah’s foreign exports peaked in the mid-1990s at about 5 million tons, then dropped to near zero in the mid-2000s. However, the foreign export market has seen a resurgence in recent years, increasing to an estimated 3.5 million tons in 2018.

Electricity (Including Renewable Resources)

Production. Electricity generation in Utah increased 3.7 percent to 38,800 gigawatthours (GWh) in 2018, but remains 17 percent below the peak generation reached in 2008. This large reduction over the past 10 years is the result of several factors, including recession-related decreases in demand, increased energy efficiency measures, an exponential increase in residential rooftop solar (which is not captured in the utility-scale generation numbers), and a reduction in demand for coal-fired generation from out-of-state users, particularly California. Coal-fired electric generation once dominated Utah’s electric portfolio, providing 94 percent of electric generation in 2005. In 2018, coal accounted for only 65 percent of electric generation; significant increases in natural gas generation (21 percent) and renewable sources (13 percent) have broadened Utah’s generation portfolio. The largest change in Utah’s electricity sector is the recent exponential increase in utility-scale PV solar capacity. Between mid-2015 and the end of 2016, 855 MW of new utility-scale solar capacity came online, more than wind, hydroelectric, geothermal, and biomass combined. Solar now accounts for a remarkable 5.9 percent of Utah’s total electric generation. In contrast, Utah’s fleet of coal-fired power plants has experienced a 33 percent reduction in net generation, most significantly from the Intermountain Power Plant (reduction of 42 percent), Huntington (reduction of 24 percent), Hunter (reduction of 16 percent), and the closure of the Carbon plant.

Prices. The overall price of electricity in Utah has remained mostly steady over the past five years. Utah’s 2018 average electric rate of 8.2 cents per kilowatthour (kWh) for all sectors of the economy is about 20 percent lower than the national average of

10.5 cents. This lower rate is mostly attributed to Utah's established fleet of coal-fired power plants, which supply 65 percent of electricity generation in the state, and low natural gas prices. The residential price of Utah's electricity decreased 3.2 percent in 2018 to 10.6 cents per kWh, which is lower than the national average of 12.9 cents per kWh.

Consumption. In general, from 1980 to 2013, electricity consumption has averaged a 3.3 percent increase annually, mirroring Utah's population rate increase (2.1 percent per year) combined with the increasing rate of consumption per capita (1.3 percent per year). However, after an initial 1.4 percent decrease from 2013 to 2014, the annual rate of electricity consumption increase dropped to an average of 0.6 percent. 2018 consumption totaled about 30,750 GWh (which is a new record high). This reduced rate is most likely related to the implementation of energy efficiency measures combined with a dramatic increase in residential rooftop solar (as stated earlier, rooftop solar electric generation and consumption reduces demand; the data are not captured within the consumption totals). Utah remains a net exporter of electricity, using only 79 percent of in-state electric generation.

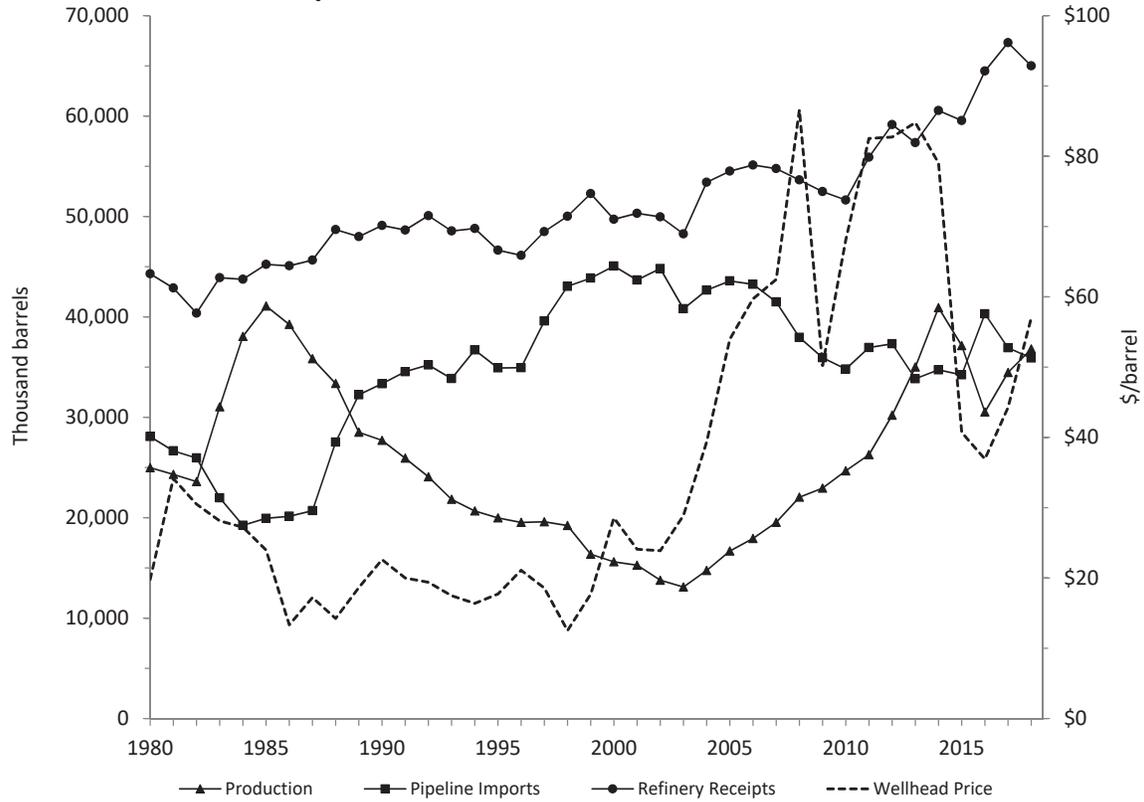
2019 Outlook

Production and Consumption. Utah began 2018 with 12 rigs drilling for oil, but throughout the year this number has dropped to about 5, significantly lower than typical. However, many of these new oil wells are long horizontals targeting the Green River Formation in the Uinta Basin and most have been very successful, hence Utah's total oil production is once again on the rise. Total crude oil production rebounded from the 2016 low, increasing 13 percent in 2017 and another 7 percent in 2018, and is expected to continue this upward trend in 2019 (perhaps by another 5–8 percent). At the same time, demand for petroleum products in Utah will continue to increase as the economy remains strong and prices for motor gasoline remain below \$3.00 a gallon. In contrast, only very minor drilling for natural gas has taken place in the past several years, resulting in a continued decrease in gas production—with 2019 production possibly hitting a low not seen since the late 1990s. Currently, no

plans exist for the construction of additional natural gas power plants in Utah, so consumption will continue to fluctuate depending on the severity of the heating and cooling seasons and the amount of generation at the existing peaking plants. Coal production in Utah is expected to remain in the 14- to 15-million-ton per year range for the near future, as in-state demand has stabilized around 13 million tons a year, and out-of-state demand continues to be weak (less than 2 million tons per year). Utah coal deliveries to the foreign export market have seen a modest jump in the past few years, and potential remains for access to a strong overseas market which could push production higher in coming years. Electricity consumption should only modestly increase in the next few years as more rooftop solar is installed and energy efficiency measures continue to offset demands from a growing population.

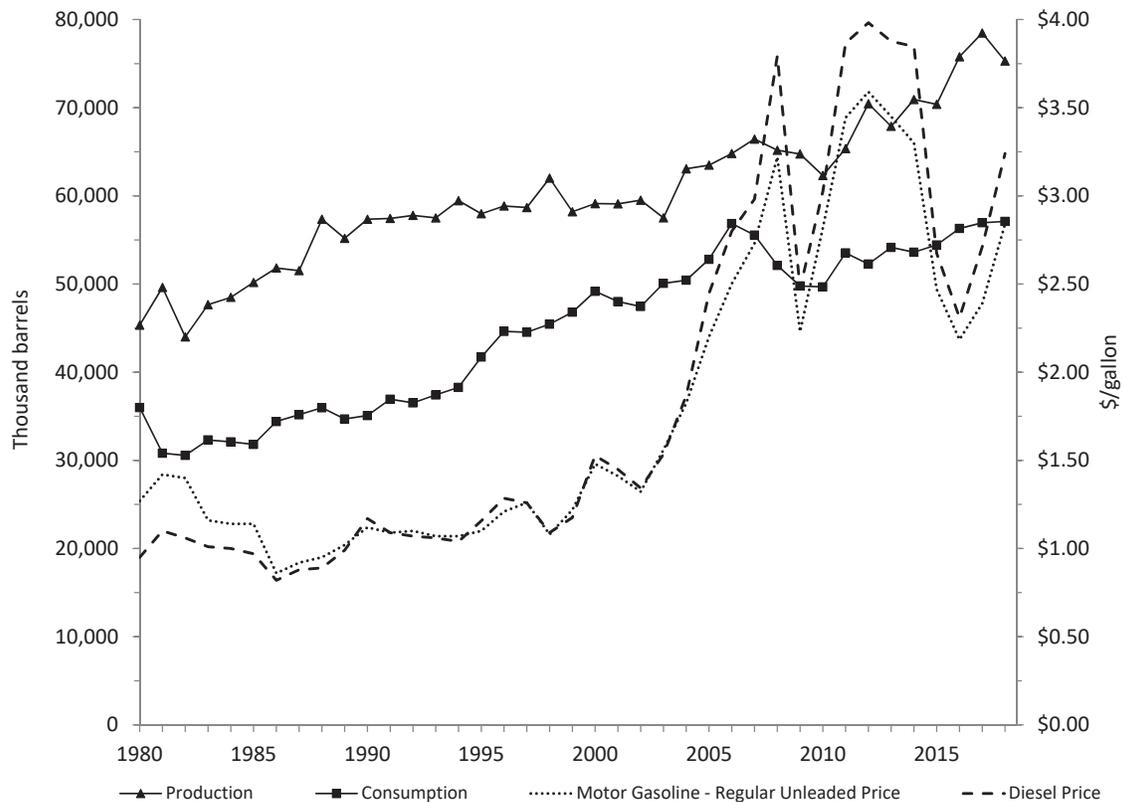
Prices. Utah crude oil prices bottomed out at about \$26 per barrel in early 2016 but rebounded to about \$60 per barrel for most of 2018. However, by early December 2018, crude prices dropped again to about \$48. Questions linger about whether prices will return to the highs seen in the early 2010s, but most estimates indicate prices should remain in the \$50–\$60 range for the foreseeable future as worldwide supply continues to adjust to increased success in exploration. The price of natural gas has remained in the mid- to upper \$2.00-per-Mcf range for the past four years (excluding brief price spikes similar to the current, late-2018, spike to over \$4 per Mcf), and projections indicate the price will likely stay in the upper \$2 range for several more years as supply greatly outpaces demand. A possible increase in domestic liquefied natural gas exports could help reduce the current oversupply, but this could take many years to fully materialize. Utah's mine-mouth coal price will remain relatively flat and is expected to average in the mid-\$30-per-ton range in coming years. With regard to electricity, Utah's well-established coal-fired power plants, as well as a new fleet of natural-gas plants and nearly 1 GW of new solar capacity, will assure affordable, reliable electric power for the foreseeable future and help keep Utah's electricity prices nearly 20 percent below the national average.

Figure 17.1
Utah's Crude Oil Production, Pipeline Imports, and Refinery Receipts Plotted with Wellhead Price, 1980-2018



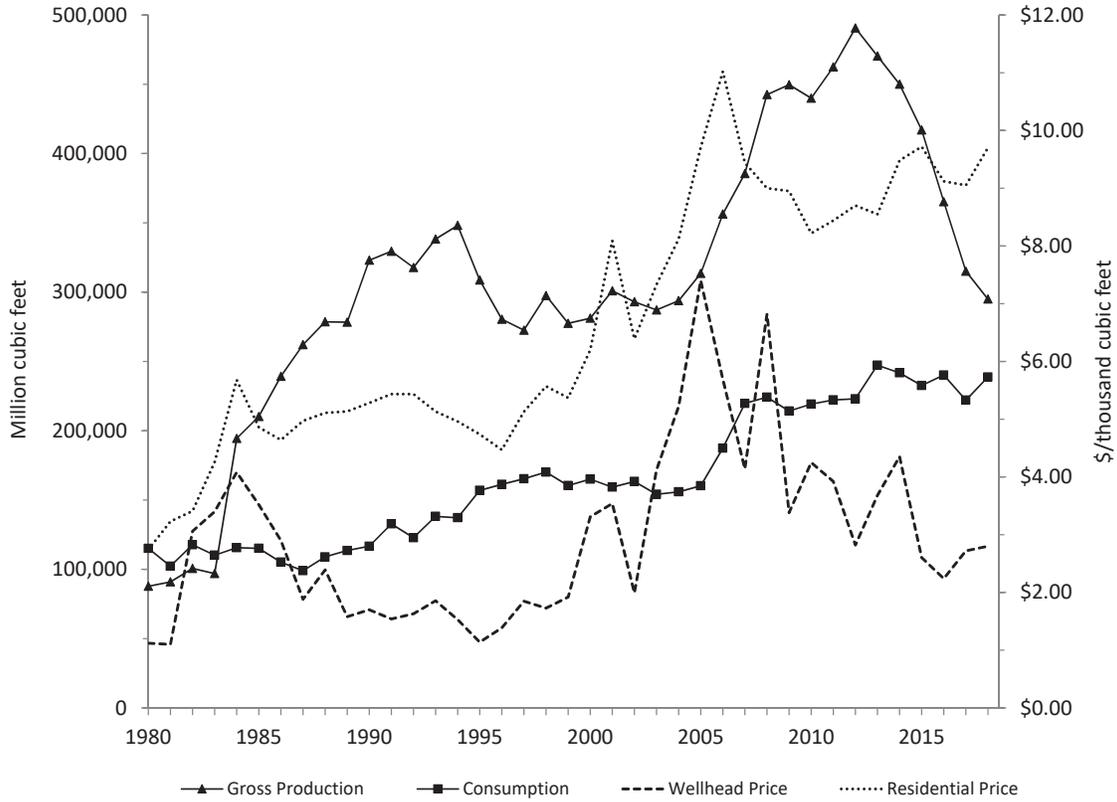
Source: Utah Geological Survey; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration

Figure 17.2
Utah's Petroleum Product Production and Consumption Plotted with Motor Gasoline and Diesel Prices, 1980-2018



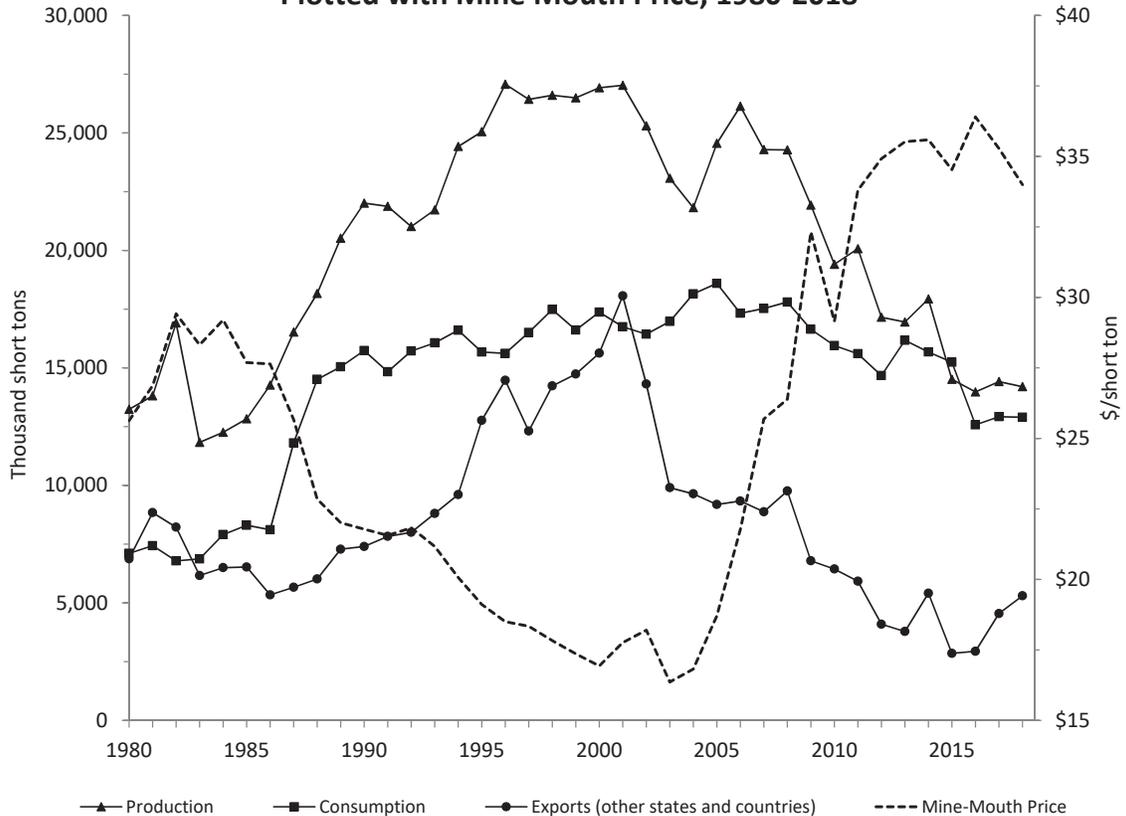
Source: Utah Geological Survey; U.S. Energy Information Administration

Figure 17.3
Utah's Natural Gas Production and Consumption
Plotted with Wellhead and Residential Prices, 1980-2018



Source: Utah Geological Survey; Utah Division of Oil, Gas and Mining; Utah State Tax Commission; U.S. Energy Information Administration

Figure 17.4
Utah's Coal Production, Consumption, and Exports
Plotted with Mine Mouth Price, 1980-2018



Source: Utah Geological Survey; U.S. Energy Information Administration

Figure 17.5
Utah's Electricity Net Generation and Consumption
Plotted with End-Use Residential Price, 1980-2018



Source: Utah Geological Survey; U.S. Energy Information Administration

Table 17.1
Supply, Disposition, Price, and Value of Crude Oil in Utah

Year	Supply ¹				Disposition				Price	Value
	Utah Crude Production	Colorado Imports	Wyoming Imports	Canadian Imports	Utah Crude Exports ²	Refinery Receipts	Refinery Inputs	Refinery Beginning Stocks		
	Thousand barrels				Thousand barrels				\$/barrel	Million \$
1980	24,979	15,846	12,233	0	8,767	44,291	44,421	665	\$19.79	\$494
1981	24,309	14,931	11,724	0	8,088	42,876	43,007	762	\$34.14	\$830
1982	23,595	13,911	12,033	0	9,167	40,372	40,368	593	\$30.50	\$720
1983	31,045	14,696	7,283	0	9,123	43,901	43,844	632	\$28.12	\$873
1984	38,054	13,045	6,195	0	13,549	43,745	43,544	606	\$27.21	\$1,035
1985	41,080	13,107	6,827	0	15,790	45,224	45,357	695	\$23.98	\$985
1986	39,243	12,567	7,574	0	14,298	45,086	45,034	559	\$13.33	\$523
1987	35,829	13,246	7,454	0	10,875	45,654	45,668	613	\$17.22	\$617
1988	33,365	12,783	14,739	0	12,197	48,690	48,604	599	\$14.24	\$475
1989	28,504	13,861	18,380	0	12,756	47,989	47,948	626	\$18.63	\$531
1990	27,705	14,494	18,844	0	11,939	49,104	48,977	656	\$22.61	\$626
1991	25,928	14,423	20,113	0	11,817	48,647	48,852	749	\$19.99	\$518
1992	24,074	13,262	21,949	0	9,206	50,079	49,776	513	\$19.39	\$467
1993	21,826	11,575	22,279	0	7,126	48,554	48,307	645	\$17.48	\$382
1994	20,668	10,480	26,227	0	8,572	48,802	48,486	691	\$16.38	\$339
1995	19,976	9,929	24,923	60	8,246	46,641	46,634	806	\$17.71	\$354
1996	19,529	9,857	24,297	783	8,339	46,126	46,265	768	\$21.10	\$412
1997	19,593	8,565	28,162	2,858	10,686	48,492	48,477	633	\$18.57	\$364
1998	19,218	8,161	28,779	6,097	12,238	50,017	49,476	613	\$12.52	\$241
1999	16,362	7,335	28,461	8,067	7,953	52,271	50,556	704	\$17.69	\$289
2000	15,608	7,163	26,367	11,528	10,950	49,716	49,999	786	\$28.53	\$445
2001	15,271	7,208	25,100	11,364	8,633	50,310	50,143	457	\$24.09	\$368
2002	13,770	7,141	25,455	12,215	8,619	49,962	49,987	591	\$23.87	\$329
2003	13,096	6,964	24,152	9,690	5,635	48,267	48,284	547	\$28.88	\$378
2004	14,742	7,559	22,911	12,195	4,007	53,400	53,180	532	\$39.35	\$580
2005	16,675	8,214	24,372	10,991	5,739	54,513	54,544	767	\$53.98	\$900
2006	17,926	9,355	23,256	10,633	6,051	55,119	55,192	728	\$59.70	\$1,070
2007	19,534	10,708	22,012	8,769	6,258	54,764	54,952	662	\$62.48	\$1,220
2008	22,040	10,259	21,316	6,382	6,360	53,637	53,165	473	\$86.58	\$1,908
2009	22,941	7,409	23,000	5,520	6,395	52,475	52,479	519	\$50.22	\$1,152
2010	24,666	6,525	24,000	4,278	7,832	51,637	51,678	511	\$68.09	\$1,679
2011	26,276	6,997	26,050	3,894	7,318	55,900	55,656	473	\$82.53	\$2,169
2012	30,204	7,805	25,118	4,394	8,368	59,153	58,961	692	\$82.73	\$2,499
2013	35,002	7,601	23,124	3,111	11,493	57,345	56,921	669	\$84.79	\$2,968
2014	40,914	7,662	23,425	3,636	15,090	60,548	60,677	798	\$79.04	\$3,234
2015	37,136	7,048	22,211	4,963	11,809	59,549	59,568	660	\$40.69	\$1,511
2016	30,528	7,110	27,318	5,873	6,348	64,482	64,496	719	\$36.92	\$1,127
2017	34,461	5,763	26,187	4,967	4,067	67,311	67,526	826	\$44.24	\$1,525
2018*	36,800	5,400	24,300	6,200	7,700	65,000	65,200	730	\$57.00	\$2,098

Note: Prices and values are in nominal dollars.

*Estimated

¹Out-of-state imports only include pipeline shipments; minor imports may arrive by truck, and additional minor imports may

²Estimated by subtracting refinery receipts from total supply; all crude oil imports are assumed to be accounted for.

Source: Utah Geological Survey; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration

Table 17.2
Supply, Disposition, and Select Prices of Petroleum Products in Utah

Year	Supply			Consumption by Product					Exports	Prices	
	Refined Product Production	Refinery Beginning Stocks	Refined Product Pipeline Imports ^{1,2}	Motor Gasoline	Jet Fuel	Distillate Fuel	All Other	Total	Pipeline Exports to Other States ^{1,3}	Motor Gasoline - Regular Unleaded	Diesel
	Thousand barrels			Thousand barrels					Thousand barrels	\$/gallon	
1980	45,340	3,202	6,427	15,534	2,637	8,401	9,411	35,983	22,136	\$1.27	\$0.95
1981	49,622	3,376	7,401	15,548	2,424	7,098	5,742	30,812	23,630	\$1.42	\$1.10
1982	44,011	2,979	8,933	15,793	2,801	6,438	5,531	30,563	22,119	\$1.40	\$1.06
1983	47,663	3,153	6,943	15,954	3,284	6,387	6,691	32,316	25,298	\$1.16	\$1.01
1984	48,493	2,842	8,215	16,151	3,413	6,107	6,430	32,101	24,121	\$1.14	\$1.00
1985	50,188	2,989	8,030	16,240	3,808	5,715	6,046	31,809	23,365	\$1.14	\$0.97
1986	51,822	2,803	8,766	17,541	4,335	6,978	5,552	34,406	20,027	\$0.86	\$0.82
1987	51,519	2,661	8,695	17,623	4,969	6,507	6,073	35,172	20,359	\$0.92	\$0.88
1988	57,354	2,306	8,926	18,148	4,977	7,060	5,786	35,971	22,031	\$0.95	\$0.89
1989	55,184	2,685	9,550	17,311	5,095	5,917	6,371	34,694	21,409	\$1.02	\$0.99
1990	57,349	3,000	10,647	16,724	5,281	7,162	5,915	35,082	21,419	\$1.12	\$1.17
1991	57,446	2,758	11,459	17,395	5,917	7,038	6,583	36,933	21,918	\$1.09	\$1.09
1992	57,786	2,746	10,534	17,905	5,607	7,286	5,726	36,524	21,087	\$1.10	\$1.07
1993	57,503	2,840	10,707	18,837	5,518	7,422	5,645	37,422	19,539	\$1.07	\$1.06
1994	59,458	3,173	11,555	19,433	5,270	7,653	5,919	38,275	21,326	\$1.07	\$1.04
1995	57,974	2,907	12,289	20,771	5,658	8,469	6,820	41,718	20,512	\$1.10	\$1.16
1996	58,852	3,253	12,692	21,170	6,303	8,746	8,409	44,628	20,512	\$1.21	\$1.29
1997	58,677	2,640	12,949	22,024	6,279	9,976	6,250	44,529	22,444	\$1.26	\$1.26
1998	62,012	2,908	12,842	22,735	6,379	10,398	5,940	45,452	22,474	\$1.08	\$1.09
1999	58,201	2,780	14,509	23,141	7,443	9,793	6,429	46,806	22,887	\$1.22	\$1.18
2000	59,125	2,426	14,568	23,895	7,701	10,629	6,954	49,179	22,811	\$1.48	\$1.53
2001	59,094	2,306	15,764	22,993	6,880	11,236	6,904	48,013	23,937	\$1.41	\$1.45
2002	59,514	2,739	16,848	24,158	6,416	11,482	5,394	47,450	24,082	\$1.32	\$1.34
2003	57,511	2,846	16,515	24,325	6,758	12,082	6,917	50,082	22,729	\$1.56	\$1.54
2004	63,071	2,599	18,486	24,744	7,137	12,264	6,289	50,434	24,475	\$1.82	\$1.87
2005	63,487	2,806	20,258	24,677	7,394	13,717	7,015	52,803	24,482	\$2.20	\$2.45
2006	64,806	2,587	18,976	25,312	7,560	17,292	6,699	56,863	23,321	\$2.50	\$2.80
2007	66,443	2,924	15,991	26,054	7,085	15,946	6,465	55,550	22,851	\$2.73	\$2.98
2008	65,178	2,513	14,854	25,051	6,509	14,138	6,415	52,113	21,619	\$3.22	\$3.79
2009	64,752	2,715	13,138	25,324	5,751	12,852	5,854	49,781	21,043	\$2.23	\$2.48
2010	62,310	2,665	12,307	24,761	5,875	12,707	6,330	49,673	21,490	\$2.82	\$3.03
2011	65,369	2,689	11,383	25,568	5,767	15,448	6,746	53,529	23,058	\$3.44	\$3.87
2012	70,456	2,860	13,316	25,228	5,572	14,776	6,688	52,264	26,695	\$3.59	\$3.98
2013	67,892	3,077	15,204	26,085	6,399	15,317	6,355	54,156	26,654	\$3.45	\$3.88
2014	70,931	2,676	13,853	26,469	5,716	15,169	6,260	53,614	27,260	\$3.30	\$3.85
2015	70,385	2,980	16,615	27,776	6,204	14,293	6,158	54,431	28,972	\$2.47	\$2.67
2016	75,780	2,771	16,402	28,535	6,944	14,248	6,574	56,301	30,966	\$2.19	\$2.31
2017^	78,473	2,652	15,530	29,000	6,678	14,600	6,675	56,953	32,666	\$2.39	\$2.71
2018*	75,300	2,918	15,800	28,900	6,950	14,600	6,650	57,100	31,700	\$2.84	\$3.24

Note: Prices are in nominal dollars.

^Consumption was estimated. *Estimated

¹Amounts shipped by truck are unknown.

²The Pioneer pipeline, originating from Sinclair, WY, is the only pipeline importing petroleum products into Utah.

³Prior to 2012, only the Chevron Petroleum pipeline exported product to the northwest (Idaho and Washington); in 2013 this line was sold to Tesoro (now Andeavor). Starting in 2012, the UNEV pipeline started shipping product to the Las Vegas area; however, a minor amount of product is offloaded near Cedar City (amount estimated).

Source: Utah Geological Survey, U.S. Energy Information Administration, Federal Energy Regulatory Agency

**Table 17.3
Supply, Disposition, Prices, and Value of Natural Gas in Utah**

Year	Production				Consumption by End Use							Prices				Value	
	Gross Production	Wet/Dry Production ¹	Actual Sales	Natural Gas Liquids	Residential	Commercial	Vehicle Fuel	Industrial	Electric Utilities	Lease, Plant, & Pipeline	Total	Wellhead	End-Use Residential	End-Use Commercial	End-Use Industrial	Natural Gas Liquids	Value of NG and NGL
	Million cubic feet			Thousand bbl	Million cubic feet							\$/thousand cubic feet				\$/bbl	Million \$
1980	87,766	87,766	na	na	45,735	12,234	0	43,545	5,133	8,445	115,092	\$1.12	\$2.74	\$5.59	\$2.26	na	\$98
1981	90,936	91,191	na	na	43,497	11,635	0	42,779	3,097	1,232	102,240	\$1.10	\$3.23	\$5.35	\$2.58	na	\$100
1982	100,628	94,255	na	na	53,482	14,306	0	39,804	3,023	7,091	117,706	\$3.06	\$3.41	\$3.43	\$2.45	na	\$288
1983	96,933	63,158	na	na	49,645	13,279	0	40,246	1,259	5,756	110,185	\$3.40	\$4.26	\$4.32	\$3.15	na	\$215
1984	194,448	74,698	na	na	49,869	13,339	0	42,709	271	9,390	115,578	\$4.08	\$5.68	\$4.96	\$3.52	na	\$305
1985	210,267	83,405	na	na	53,043	14,189	0	37,448	235	10,202	115,117	\$3.52	\$4.86	\$4.91	\$3.23	na	\$294
1986	239,259	90,013	na	na	49,144	13,146	0	28,264	230	14,391	105,175	\$2.90	\$4.64	\$4.73	\$3.00	na	\$261
1987	262,084	87,158	na	na	41,536	14,811	0	23,884	263	18,493	98,987	\$1.88	\$4.97	\$4.98	\$3.20	na	\$164
1988	278,578	101,372	na	na	42,241	17,911	0	30,354	196	18,251	108,953	\$2.39	\$5.11	\$4.08	\$3.10	na	\$242
1989	278,321	120,089	na	na	45,168	16,522	0	33,963	636	17,248	113,537	\$1.58	\$5.14	\$4.16	\$3.30	na	\$190
1990	323,028	145,875	63,336	na	43,424	16,220	1	35,502	907	20,594	116,648	\$1.70	\$5.28	\$4.30	\$3.62	na	\$248
1991	329,464	144,817	65,288	na	50,572	19,276	6	43,120	5,190	14,602	132,766	\$1.54	\$5.44	\$4.50	\$3.69	na	\$223
1992	317,763	171,293	94,725	na	44,701	16,584	150	40,878	6,576	13,895	122,785	\$1.63	\$5.44	\$4.40	\$3.91	na	\$279
1993	338,276	212,101	132,660	5,365	51,779	22,588	188	42,300	6,305	15,039	138,199	\$1.86	\$5.13	\$4.06	\$3.67	\$5.35	\$422
1994	348,140	257,078	153,931	5,374	48,922	26,501	201	36,618	8,900	16,080	137,222	\$1.53	\$4.96	\$3.84	\$2.74	\$6.04	\$426
1995	308,695	227,611	156,299	6,360	48,975	26,825	286	42,335	8,707	29,843	156,971	\$1.14	\$4.74	\$3.64	\$2.34	\$4.82	\$290
1996	280,439	239,797	169,254	7,204	54,344	29,543	378	42,213	4,087	30,720	161,285	\$1.39	\$4.47	\$3.38	\$2.10	\$6.63	\$380
1997	272,554	239,267	177,087	6,007	58,108	31,129	273	44,162	4,079	27,554	165,305	\$1.85	\$5.13	\$3.92	\$2.55	\$6.94	\$484
1998	297,503	265,539	191,073	5,750	56,843	30,955	636	45,501	5,945	30,254	170,134	\$1.73	\$5.57	\$4.35	\$3.00	\$4.26	\$483
1999	277,494	251,207	164,050	5,574	55,474	30,361	889	40,858	6,478	26,371	160,431	\$1.92	\$5.37	\$4.13	\$2.94	\$6.18	\$517
2000	281,170	256,490	140,226	5,150	55,626	31,282	848	39,378	10,544	27,344	165,022	\$3.31	\$6.20	\$4.92	\$3.93	\$11.31	\$907
2001	300,966	272,534	219,138	4,641	55,008	30,917	474	33,584	15,141	24,175	159,300	\$3.54	\$8.09	\$6.78	\$5.29	\$12.47	\$1,023
2002	293,030	271,387	250,172	3,542	59,398	33,501	482	26,879	15,439	27,681	163,380	\$1.99	\$6.39	\$5.20	\$3.91	\$8.91	\$572
2003	287,141	264,654	224,327	3,080	54,632	30,994	589	25,200	14,484	28,226	154,125	\$4.12	\$7.33	\$5.95	\$5.04	\$12.18	\$1,128
2004	293,807	274,588	253,855	3,196	60,527	31,156	661	26,674	9,423	27,450	155,891	\$5.22	\$8.12	\$6.75	\$5.90	\$19.66	\$1,496
2005	313,491	298,408	269,062	2,310	58,044	34,447	187	25,370	12,239	29,989	160,276	\$7.40	\$9.71	\$8.23	\$7.33	\$32.31	\$2,283
2006	356,339	345,409	320,163	1,925	60,017	34,051	186	29,076	28,953	35,116	187,399	\$5.69	\$11.02	\$9.61	\$8.02	\$31.40	\$2,026
2007	385,517	373,680	350,285	1,769	60,563	34,447	209	31,578	56,438	36,464	219,699	\$4.14	\$9.44	\$8.03	\$6.35	\$45.16	\$1,627
2008	442,524	430,286	382,960	2,564	65,974	37,612	208	33,112	55,374	31,907	224,187	\$6.82	\$9.00	\$7.74	\$7.21	\$68.15	\$3,109
2009	449,675	435,673	390,475	4,817	65,184	37,024	149	29,845	49,984	32,034	214,220	\$3.38	\$8.95	\$7.57	\$5.62	\$38.87	\$1,660
2010	439,929	422,067	387,593	5,869	66,087	38,461	203	32,079	48,399	33,985	219,214	\$4.25	\$8.22	\$6.83	\$5.57	\$49.98	\$2,087
2011	462,495	442,615	406,323	7,571	70,076	40,444	290	33,633	40,138	37,646	222,227	\$3.92	\$8.44	\$7.05	\$5.50	\$60.99	\$2,197
2012	490,571	474,756	436,090	8,106	59,801	35,363	289	36,350	47,138	44,098	223,039	\$2.82	\$8.70	\$7.00	\$4.69	\$50.49	\$1,748
2013	470,345	455,454	409,704	8,132	70,491	41,398	224	38,009	49,562	47,602	247,286	\$3.68	\$8.55	\$7.13	\$5.22	\$54.03	\$2,115
2014	450,020	435,893	391,536	9,693	62,458	38,156	256	38,330	58,780	43,758	241,738	\$4.35	\$9.48	\$7.71	\$5.87	\$46.13	\$2,343
2015	417,018	401,722	360,018	7,286	58,562	35,772	326	37,189	56,449	44,315	232,613	\$2.60	\$9.72	\$7.97	\$5.93	\$22.84	\$1,213
2016	365,256	352,437	319,056	5,573	63,929	39,066	347	38,568	59,684	38,562	240,156	\$2.24	\$9.12	\$7.43	\$5.52	\$25.51	\$932
2017	315,068	303,788	278,012	4,813	66,700	41,264	354	40,007	40,900	32,862	222,087	\$2.72	\$9.05	\$7.40	\$5.51	\$31.94	\$980
2018*	295,000	285,000	257,000	4,300	66,800	41,600	340	40,000	59,000	31,000	238,740	\$2.60	\$9.70	\$7.50	\$5.40	\$40.00	\$913

Note: Prices and values are in nominal dollars.

*Estimated

na = not available, NG = natural gas, NGL = natural gas liquids

¹1980–1992 = wet natural gas, which includes NG liquids; 1993–2018 = dry natural gas.

Source: Utah Geological Survey; Utah State Tax Commission; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration

Table 17.4
Supply, Disposition, Price, and Value of Coal in Utah

Year	Supply		Distribution	Consumption by End Use					Exports		Prices		Value
	Production	Imports	Total Distribution of Utah Coal	Residential & Commercial	Coke Plants	Other Industrial	Electric Utilities	Total	To Other U.S. States	To Canada and/or Overseas	Mine Mouth	End-Use Electric Utilities	Value of Utah Coal
	Thousand short tons		Thousand short tons	Thousand short tons					Thousand short tons		\$/short ton		Million \$
1980	13,236	1,214	13,014	237	1,473	501	4,895	7,106	6,100	776	\$25.63	\$26.11	\$339
1981	13,808	1,136	14,627	196	1,477	804	4,956	7,433	5,369	3,472	\$26.87	\$28.88	\$371
1982	16,912	798	15,397	177	845	818	4,947	6,787	6,044	2,177	\$29.42	\$32.55	\$498
1983	11,829	937	12,188	191	831	627	5,223	6,872	4,818	1,346	\$28.32	\$30.87	\$335
1984	12,259	1,539	12,074	259	1,326	608	5,712	7,905	5,651	849	\$29.20	\$30.63	\$358
1985	12,831	1,580	14,361	252	1,254	472	6,325	8,303	5,901	625	\$27.69	\$32.34	\$355
1986	14,269	1,145	13,243	191	785	380	6,756	8,112	4,790	551	\$27.64	\$32.39	\$394
1987	16,521	1,358	16,989	124	0	507	11,175	11,806	5,107	555	\$25.67	\$29.05	\$424
1988	18,164	2,191	18,204	196	1,176	597	12,544	14,513	4,973	1,044	\$22.85	\$28.96	\$415
1989	20,517	2,344	20,289	231	1,178	686	12,949	15,044	5,108	2,175	\$22.01	\$28.49	\$452
1990	22,012	2,121	21,507	267	1,231	676	13,563	15,737	5,649	1,751	\$21.78	\$26.91	\$479
1991	21,875	2,014	21,444	305	1,192	508	12,829	14,834	5,744	2,086	\$21.56	\$27.24	\$472
1992	21,015	2,672	21,052	223	1,114	525	13,857	15,719	5,741	2,260	\$21.83	\$27.59	\$459
1993	21,723	2,076	22,242	121	1,005	727	14,210	16,063	5,844	2,959	\$21.17	\$27.15	\$460
1994	24,422	2,427	23,225	105	1,007	835	14,656	16,603	6,912	2,698	\$20.07	\$25.85	\$490
1995	25,051	1,847	25,522	77	990	915	13,693	15,675	8,837	3,930	\$19.11	\$24.84	\$479
1996	27,071	1,785	28,159	94	1,047	512	13,963	15,616	9,167	5,305	\$18.50	\$24.36	\$501
1997	26,428	2,840	26,271	123	1,020	709	14,654	16,506	8,898	3,414	\$18.34	\$24.87	\$485
1998	26,600	2,543	26,764	113	971	1,304	15,094	17,482	11,698	2,535	\$17.83	\$25.66	\$474
1999	26,491	1,938	25,715	114	741	744	15,011	16,610	12,424	2,313	\$17.36	\$23.60	\$460
2000	26,920	2,535	27,955	59	984	1,166	15,164	17,373	12,553	3,073	\$16.93	\$23.16	\$456
2001	27,024	3,062	26,906	60	547	1,235	14,906	16,748	15,920	2,144	\$17.76	\$25.48	\$480
2002	25,299	2,251	24,392	198	0	592	15,644	16,434	13,170	1,142	\$18.20	\$21.84	\$460
2003	23,069	2,039	23,551	61	0	611	16,302	16,974	9,584	318	\$16.36	\$23.20	\$377
2004	21,818	3,033	23,145	214	0	1,330	16,606	18,150	9,294	346	\$16.82	\$24.95	\$367
2005	24,556	2,776	23,025	45	0	1,431	17,118	18,594	8,835	351	\$18.71	\$24.52	\$459
2006	26,131	1,925	24,520	35	0	680	16,609	17,324	9,279	55	\$21.77	\$27.34	\$569
2007	24,288	1,596	24,451	23	0	911	16,593	17,527	8,877	0	\$25.69	\$30.33	\$624
2008	24,275	2,528	25,426	0	0	873	16,927	17,800	9,219	541	\$26.39	\$30.66	\$641
2009	21,927	4,251	20,487	0	0	718	15,925	16,643	6,643	148	\$32.32	\$33.96	\$709
2010	19,406	1,775	19,220	0	0	717	15,233	15,950	5,807	634	\$29.15	\$37.68	\$566
2011	20,073	2,020	19,039	0	0	598	15,005	15,603	4,841	1,081	\$33.80	\$39.21	\$678
2012	17,155	1,708	16,140	0	0	588	14,084	14,672	3,012	1,080	\$34.92	\$42.06	\$599
2013	16,953	1,864	16,328	0	0	645	15,529	16,174	2,673	1,110	\$35.52	\$44.73	\$602
2014	17,933	1,967	17,829	0	0	614	15,062	15,676	2,543	2,869	\$35.59	\$46.03	\$638
2015	14,513	3,098	14,938	0	0	662	14,580	15,242	2,116	735	\$34.53	\$42.37	\$501
2016	13,978	1,908	14,620	0	0	575	12,001	12,576	1,891	1,049	\$36.40	\$42.19	\$509
2017	14,417	2,314	14,193	0	0	485	12,438	12,923	1,792	2,754	\$35.28	\$42.00	\$509
2018*	14,200	2,300	14,000	0	0	500	12,400	12,900	1,800	3,500	\$34.00	\$44.00	\$483

Note: Prices and values are in nominal dollars.

*Estimated

Source: Utah Geological Survey, U.S. Energy Information Administration

Table 17.5
Supply, Disposition, and Price of Electricity in Utah

Year	Net Generation by Fuel Type										Consumption by End Use				Prices by End Use				
	Coal	Petroleum	Natural Gas	Hydro	Geo-thermal	Wind	Solar	Biomass ¹	Other ²	Total	Residential	Commercial	Industrial	Total	Residential Consumption Per Capita	Residential	Commercial	Industrial	All Sectors
	Gigawatthours										Gigawatthours				MWh/person	¢/kilowatthour			
1980	10,870	63	358	821	0	0	0	0	0	12,112	3,116	3,141	4,448	10,705	2.11	5.5	4.3	3.3	4.3
1981	10,869	40	230	623	0	0	0	0	0	11,762	3,436	2,999	5,451	11,886	2.27	6.0	5.0	3.7	4.7
1982	10,635	29	203	1,024	0	0	0	0	0	11,891	3,785	3,207	5,399	12,391	2.43	6.3	5.7	4.2	5.2
1983	10,921	40	69	1,394	0	0	0	0	0	12,424	3,804	3,350	6,040	13,194	2.38	6.9	6.3	4.4	5.6
1984	12,321	30	8	1,391	38	0	0	0	0	13,788	3,856	4,269	4,592	12,717	2.38	7.4	6.5	4.6	6.0
1985	14,229	40	14	1,019	110	0	0	0	0	15,412	3,985	4,596	4,458	13,039	2.43	7.8	6.9	5.0	6.4
1986	15,155	74	6	1,413	172	0	0	0	0	16,819	3,989	4,682	4,318	12,989	2.40	8.0	7.1	5.2	6.6
1987	25,221	92	13	856	164	0	0	0	0	26,346	3,980	4,863	4,555	13,398	2.37	8.0	7.1	4.9	6.5
1988	28,806	59	5	593	174	0	0	0	0	29,637	4,151	5,035	5,321	14,507	2.46	7.8	7.0	4.6	6.2
1989	29,676	48	37	562	173	0	0	0	0	30,496	4,163	5,173	5,629	14,965	2.44	7.4	6.7	4.1	5.8
1990	31,523	52	146	508	152	0	0	0	182	32,564	4,246	5,389	5,766	15,402	2.46	7.1	6.3	3.8	5.5
1991	28,888	51	550	627	186	0	0	0	204	30,506	4,460	5,571	5,876	15,907	2.50	7.1	6.1	3.9	5.5
1992	31,553	34	631	602	233	0	0	0	230	33,284	4,505	5,850	6,212	16,567	2.45	7.0	6.0	3.7	5.3
1993	32,126	37	606	860	187	0	0	0	281	34,097	4,726	5,920	6,221	16,867	2.50	6.9	6.0	3.8	5.3
1994	33,131	33	807	750	233	0	0	0	281	35,235	5,009	6,340	6,498	17,847	2.57	6.9	5.9	3.8	5.4
1995	30,611	36	791	969	168	0	0	0	261	32,836	5,041	6,462	6,957	18,460	2.53	6.9	5.9	3.7	5.3
1996	31,101	47	324	1,049	223	0	0	0	239	32,983	5,481	6,717	7,660	19,858	2.68	7.0	5.9	3.7	5.3
1997	32,544	47	328	1,344	203	0	0	0	281	34,747	5,661	7,285	7,430	20,376	2.70	6.9	5.7	3.5	5.2
1998	33,588	35	528	1,315	195	0	0	0	285	35,945	5,756	7,433	7,511	20,700	2.69	6.8	5.7	3.5	5.2
1999	34,534	31	610	1,255	186	0	0	8	191	36,815	6,236	8,075	7,568	21,879	2.84	6.3	5.3	3.4	4.9
2000	34,491	58	890	746	186	0	0	9	258	36,639	6,514	8,754	7,917	23,185	2.90	6.3	5.2	3.4	4.8
2001	33,679	58	1,446	508	186	0	0	5	4	35,887	6,693	9,113	7,411	23,217	2.92	6.7	5.6	3.5	5.2
2002	34,488	54	1,380	458	247	0	0	6	5	36,638	6,938	9,309	7,019	23,267	2.98	6.8	5.6	3.8	5.4
2003	35,979	33	1,383	421	198	0	0	5	4	38,024	7,166	9,048	7,646	23,860	3.02	6.9	5.6	3.8	5.4
2004	36,618	33	910	450	195	0	0	4	3	38,212	7,325	9,370	7,816	24,512	3.01	7.2	5.9	4.0	5.7
2005	35,970	41	1,178	784	185	0	0	4	3	38,165	7,567	9,444	7,989	25,000	3.02	7.5	6.1	4.2	5.9
2006	36,856	62	3,389	747	191	0	0	15	5	41,263	8,232	9,778	8,356	26,366	3.20	7.6	6.2	4.2	6.0
2007	37,171	39	7,424	539	164	0	0	31	5	45,373	8,752	10,275	8,759	27,785	3.32	8.2	6.5	4.5	6.4
2008	38,020	44	7,366	668	254	24	0	24	179	46,579	8,786	10,319	9,086	28,192	3.26	8.3	6.7	4.6	6.5
2009	35,526	36	6,444	835	279	160	0	48	215	43,543	8,725	10,268	8,594	27,587	3.19	8.5	7.0	4.8	6.8
2010	34,057	50	6,455	696	277	448	0	56	210	42,249	8,834	10,402	8,808	28,044	3.19	8.7	7.2	4.9	6.9
2011	33,138	54	5,256	1,230	330	573	0	58	197	40,836	8,947	10,579	9,333	28,859	3.17	9.0	7.4	5.1	7.1
2012	30,799	40	6,580	748	335	704	2	60	137	39,403	9,188	10,841	9,694	29,723	3.21	9.9	8.1	5.6	7.8
2013	34,285	26	6,606	505	319	540	2	71	163	42,517	9,402	11,062	10,010	30,474	3.24	10.4	8.3	5.9	8.2
2014	33,377	24	8,376	633	522	660	2	73	118	43,785	8,964	11,114	9,965	30,043	3.05	10.7	8.5	6.1	8.4
2015	31,656	20	8,218	769	430	626	32	85	114	41,949	9,117	11,670	9,405	30,192	3.04	10.9	8.6	6.2	8.5
2016	25,939	32	8,691	760	485	822	1,054	84	267	38,134	9,371	11,622	9,187	30,180	3.07	11.0	8.8	6.3	8.7
2017	26,390	38	5,871	1,294	481	858	2,211	78	191	37,412	9,511	11,795	9,283	30,589	3.04	11.0	8.7	6.1	8.6
2018*	25,300	35	8,200	1,300	475	900	2,300	80	220	38,810	9,500	11,950	9,300	30,750	2.97	10.6	8.4	5.8	8.2

Note: Prices are in nominal dollars.

*Estimated

¹Includes landfill gas, biogenic municipal solid waste, and other biogenic gases.

²Includes blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels, as well as nonbiogenic municipal solid waste.

Source: Utah Geological Survey, U.S. Energy Information Administration

18. Minerals

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2018 Overview

The Utah Geological Survey (UGS) projects an estimated gross production value of metallic and industrial mineral commodities in 2018 of \$3.3 billion, an increase of about \$482 million (17 percent) from the value in 2017. This increase in total value is primarily a result of higher commodity prices and increased production from the Bingham Canyon mine.

The U.S. Geological Survey reports the 2017 value of Utah's nonfuel (metallic and industrial) minerals production ranks eighth nationally, accounting for 3.5 percent of the total U.S. nonfuel minerals production. The UGS's 2018 production values are derived primarily from annual industry production surveys, corporate quarterly reports, and discussions with mining industry professionals.

Utah's 2018 estimated \$3.3 billion total mineral value broken-down by mineral industry sector consists of a base metals value of \$1.8 billion (55 percent), precious metals value of \$295 million (8.9 percent), and industrial minerals value of \$1.2 billion (36 percent). Utah's base metal production includes copper, magnesium, beryllium, and molybdenum, in decreasing order of importance. Gold is Utah's top precious metal, followed by silver. Utah also produces a long list of industrial mineral commodities including potash, salt, magnesium chloride, sand and gravel, crushed stone, Portland cement, lime, limestone, phosphate, Gilsonite, and a variety of less valuable mineral products.

The massive April 2013 Manefay landslide at Kennecott Utah Copper's Bingham Canyon open-pit copper-gold-molybdenum-silver mine had a significant negative impact on Utah's mineral production value from 2013 to 2018, and these negative consequences may linger into 2019. However, Bingham's mineral production has nearly doubled since 2015 and Kennecott has announced plans for a long-term pit expansion, called the south

wall pushback, which is expected to extend the mine life through 2027.

Copper production from both the Lisbon Valley copper mine in San Juan County and the CS Mining copper mine in Beaver County was suspended in mid-2016 as a result of falling copper prices. While the Lisbon Valley open-pit heap leach resumed operations, CS Mining went through bankruptcy. The CS open-pit copper operation was acquired by Tamra Mining Company, LLC and restarted production in late 2017. Both properties continue to produce copper, but at reduced levels.

Metal production from the Materion Natural Resources beryllium mine in Juab County and the US Magnesium, LLC magnesium operation in Tooele County remains relatively unchanged. The CML iron mine west of Cedar City closed due to low iron ore prices in October 2014 and has not reopened. Uranium mining operations in southeastern Utah have remained closed since 2012 as a result of continuing low uranium prices, which has also resulted in the loss of their byproduct vanadium production.

Based on company projections, change in production of most industrial mineral commodities from 2017 to 2018 will not be significant. However, U.S. Geological Survey data from the first half of 2018 suggest that construction aggregate production is up 12 percent in 2018 compared with 2017 after falling the previous year. Construction aggregate, consisting of sand and gravel and crushed stone, is one of the more significant commodities in Utah. Production of construction aggregate will likely remain relatively high over the next few years due to ongoing construction of the Salt Lake City airport and other construction driven by Utah's increasing population.

Metal exploration and development activities in Utah rebounded slightly in 2018. The Goldstrike mining district in northwestern Washington County has seen an unprecedented 500 hole drilling

campaign by Liberty Gold over the last four years. This campaign has produced an indicated and inferred resource of 85,388,000 tons at 0.49 ppm gold for a total of 1.22 million contained ounces at a 0.2 ppm gold cutoff. Similarly, TriMetals Mining is defining a small, open-pit gold-silver resource in the Gold Springs district of westernmost Iron County. They have defined an indicated and inferred resource of 32,894,000 tons at 0.55 ppm gold and 10 ppm silver for a total of 528,000 ounces of gold and 9,596,000 ounces of silver at a 0.25 ppm gold cutoff. Alderan Resources is pursuing copper targets in the San Francisco mining district in Beaver County. They have completed about 20 core holes primarily near the old Cactus and Imperial copper mines. A recent hole intersected an encouraging 177 ft of 1.4 percent copper with silver and gold credits. Kennecott also continues its long-term program to discover additional mineral resources in the Oquirrh Mountains of Salt Lake and Tooele counties. In addition to these programs, exploration continues in the Tintic district, Juab County; Gold Hill district, Tooele County; Henry Mountain district, Garfield County; and Drum Mountain district, Juab and Millard counties. New in 2018 is interest in vanadium exploration due to its rapidly escalating demand and price. Vanadium has been an important byproduct from some of the uranium mines in southeast Utah and this new exploration effort has been focused there.

Recent exploration of industrial minerals has focused primarily on lithium and frac sand. Several thousand lithium claims were filed in 2016 and 2017 on Utah BLM land, and minor assessment work was performed in conjunction with these claims. Lithium

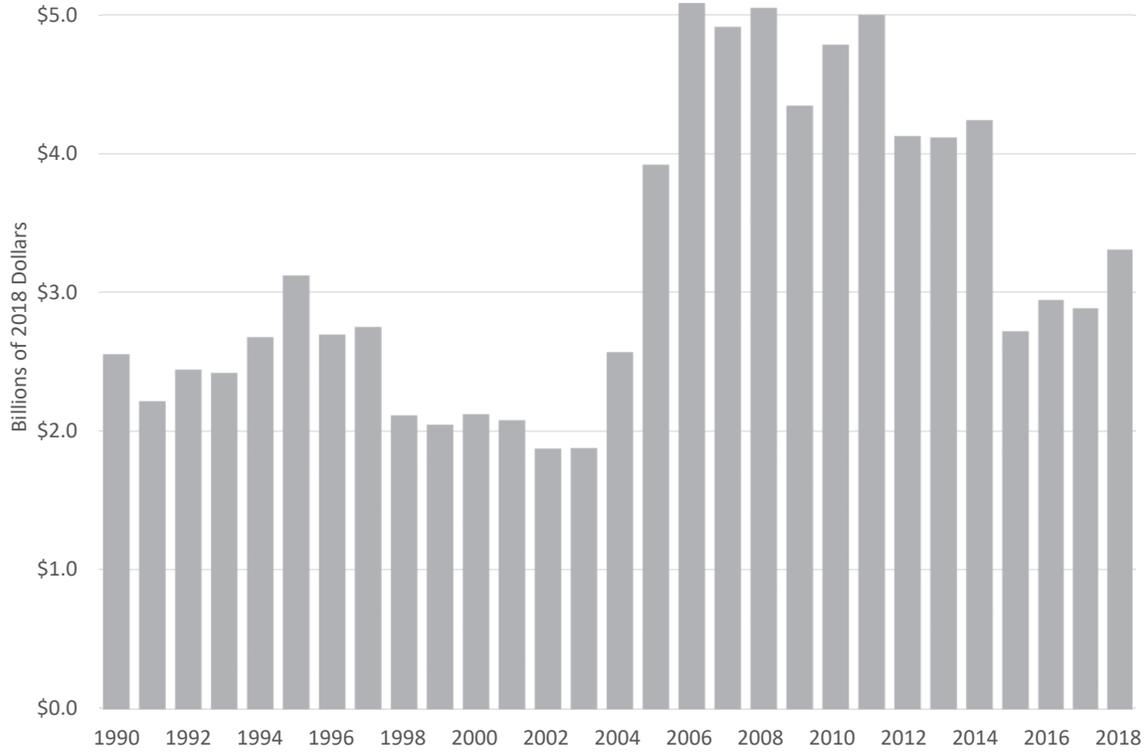
exploration has been driven by a surge in global demand and increasing prices, but interest will likely wane as large producers and advanced exploration projects in Australia and South America increase production and move toward development. Interest in frac sand is a response to the oil and gas industry's trend of using ever increasing amounts of sand in hydraulic fracturing of wells. Several areas in Utah have been investigated for frac sand resources, but no projects have made significant advances towards production. Interest may subside somewhat following the completion of a frac sand rail terminal in Wellington, Utah.

Earlier in the decade, several potash exploration projects were active in Utah. Although interest in potash overall has waned, one project continues to advance. Crystal Peak Mineral's Sevier Lake potash project completed a feasibility study in 2018 and continues to make progress on its EIS. They intend to produce potassium sulfate, a more valuable type of potash than the typical potassium chloride.

2019 Outlook

Growing base and precious metal production from a recovering Bingham Canyon mine will likely result in an increase in the value of metals in 2019. Industrial minerals production and value is expected to remain stable through 2019, with no anticipated substantial swings in commodity prices or production. In summary, the UGS estimates that the gross production value of Utah's metallic and industrial mineral commodities in 2019 will be incrementally higher than 2018 totals, driven by higher production at the Bingham Canyon mine.

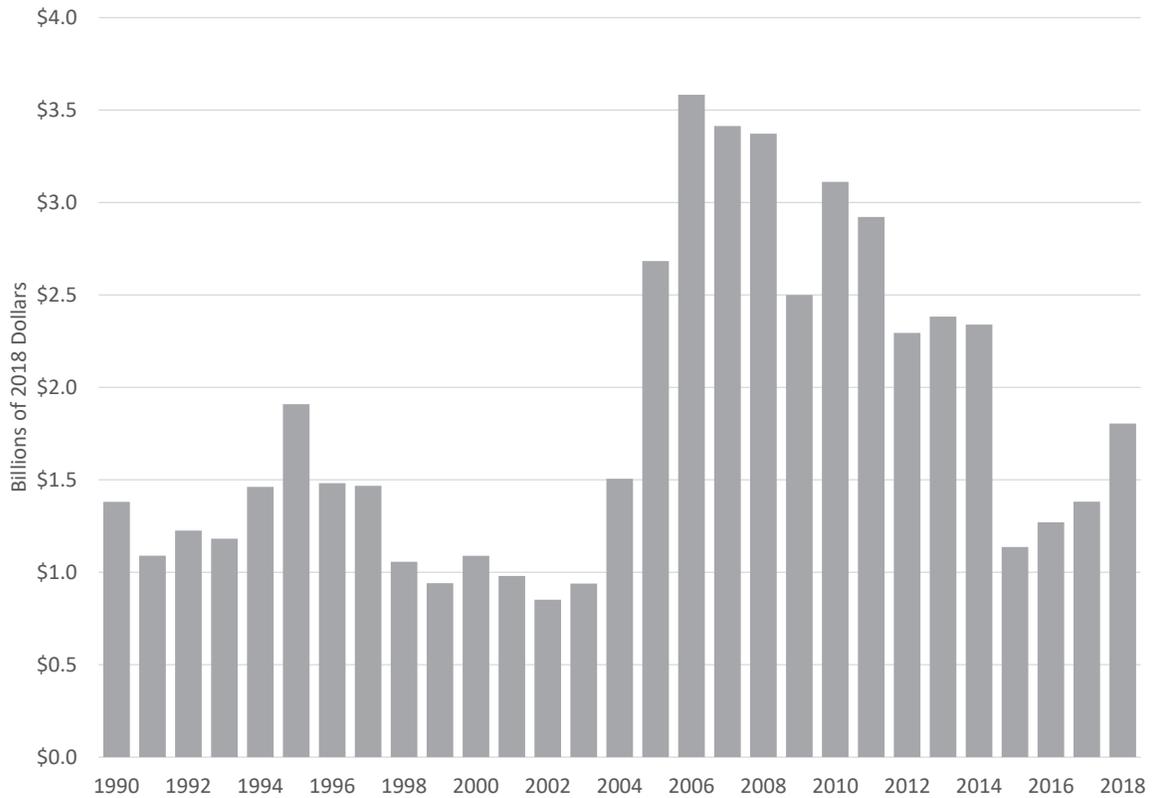
Figure 18.1
Value of Utah's Annual Nonfuel Production



Note: The value presented for 2018 is an estimate.

Source: Utah Geological Survey

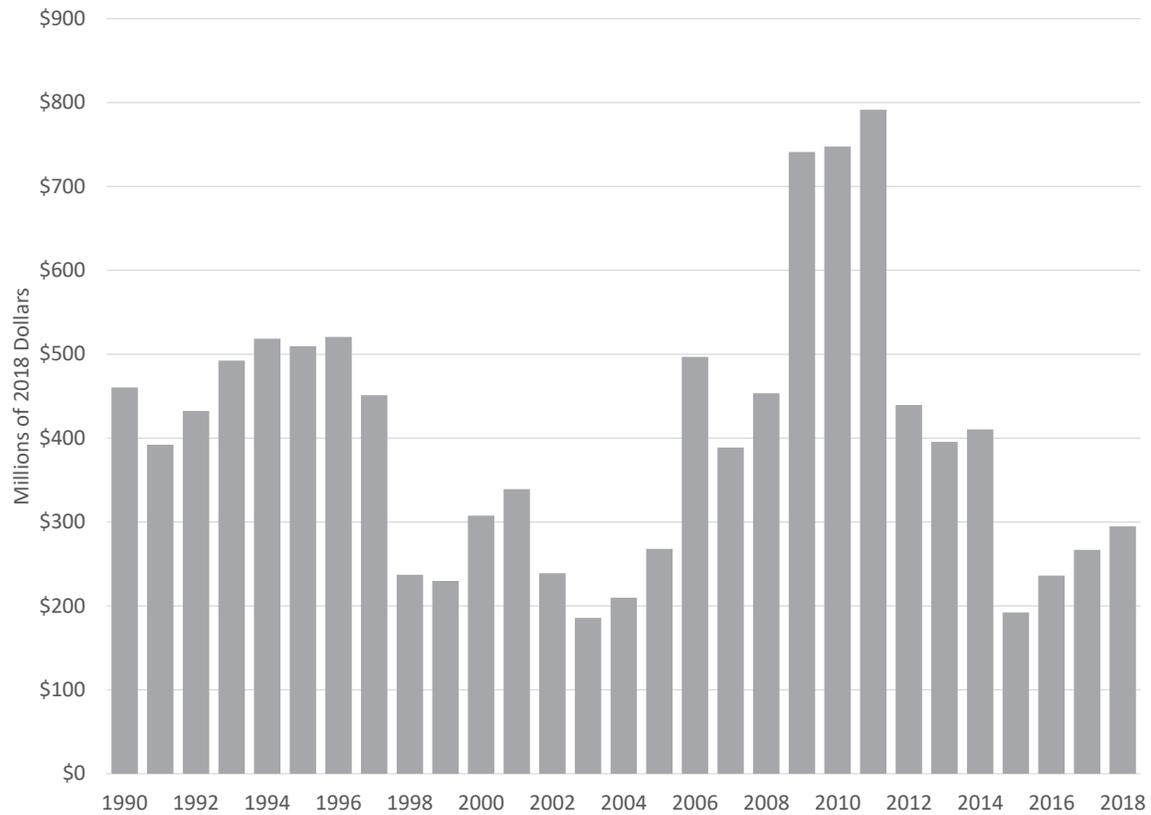
Figure 18.2
Value of Utah's Annual Base Metal Production



Note: The value presented for 2018 is an estimate.

Source: Utah Geological Survey

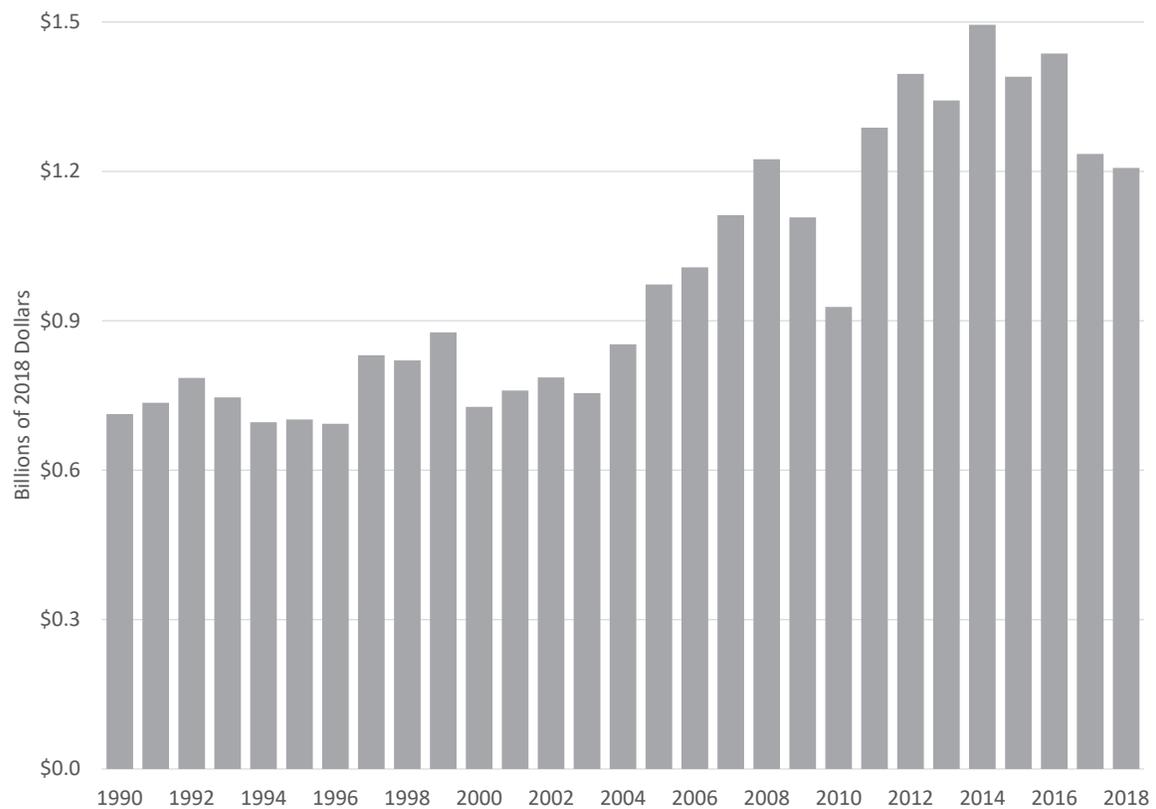
Figure 18.3
Value of Utah's Annual Precious Metal Production



Note: The value presented for 2018 is an estimate.

Source: Utah Geological Survey

Figure 18.4
Value of Utah's Annual Industrial Mineral Production



Note: The value presented for 2018 is an estimate.

Source: Utah Geological Survey