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2020 OVERVIEW

The story of Utah's energy economy in 2020 is linked to the worldwide response to the COVID-19 pandemic. Energy metrics across the board were impacted as stay-at-home directives were implemented starting in March 2020, with restrictions continuing well into the fall. Energy demand in nearly all downstream areas declined in 2020, which rippled through upstream sectors affecting both prices and production. The petroleum sector was hardest hit as plunging prices coupled with plummeting demand resulted in laid down drill rigs, shut-in wells, and layoffs in Utah's energy communities.

Utah crude oil prices averaged \$34 per barrel in 2020, but experienced significant swings; starting the year near \$50, then dropped briefly below \$10 after the initial onset of the pandemic, before rebounding to the low \$30 range later in the year. The volatility in oil prices coupled with decreased demand for petroleum products related to travel restrictions resulted in decreased Utah oil production, down 14% to 31.6 million barrels in 2020. COVID-19 restrictions did not influence natural gas markets as severely as the oil sector. Natural gas prices decreased in 2020, but this was mostly the result of continued oversupply from prolific U.S. shale reservoirs. As a result, drilling for natural gas in Utah virtually stopped years ago and production has declined by 50% since the 2012 peak.

Construction of new utility-scale solar facilities continued in 2019 and 2020 with the addition of over 400 megawatts (MW) of capacity, with nearly 1000 MW additional capacity slated for development in the next few years. Solar now dominates Utah's renewable energy portfolio providing 63% of total renewable capacity. This surge in solar has also occurred in the residential sector; the total installed residential PV capacity in Utah has increased from just 6 MW in 2013 to more than 315 MW in 2019.

Decreases in the demand for electricity in 2020 were disproportionately felt by coal-fired power plants, resulting in a decrease in coal demand which translated into a decrease in Utah coal production, down to 13.2 million tons, the lowest level since 1985. The establishment of a foreign export coal market continues to be a challenge as access to West Coast ports remain in question. Overall, generation of electricity in Utah has decreased 20% in the past 12 years, mostly from coal-fired power plants, whereas natural gas-fired power plants and renewable resources have greatly increased their share of total generation.

Numerous uncertainties still linger as to how Utah's energy industry, in particular the oil and gas sector, will recover from the dramatic disruptions in 2020. However, several signs indicate a reason for optimism. Oil prices rebounded much faster than most expected in early summer, and though not yet back to pre-COVID levels, the higher prices resulted in operators turning their oil wells back to full production and the completing of several wells that were drilled pre-COVID-19. In addition, drill rigs returned to the Uinta Basin starting in August and three to four rigs have continued drilling through the fall. Demand for petroleum products in Utah has mostly rebounded and impacts to electricity demand have been minimal and short lived.

Petroleum

Production Crude oil production dropped in 2016 to 30.5 million barrels following a significant drop in oil prices but rebounded back to about 37 million barrels in 2018 and 2019. In early 2020, the petroleum industry in Utah was poised to have another high production year, but in March, the COVID-19 pandemic caused major global disruptions to petroleum prices and demand, which rippled through Utah. By May 2020, all drill rigs ceased operations in Utah (eight rigs were drilling in early March) and companies shut-in or reduced flow from hundreds of wells. This restriction in activities resulted in production

dropping from 95,000 barrels per day in early 2020 down to 69,000 barrels per day in May. Production in Utah rebounded rather quickly, following strengthening crude oil prices in the early summer. By August 2020, production had returned to over 84,000 barrels per day and is expected to continue to climb through the remainder of the year. Crude oil production for 2020 is expected to reach 31.6 million barrels, a 14% decrease from 2019.

Total crude oil pipeline imports from Colorado, Wyoming, and Canada decreased 15% to 34 million barrels in 2020, as refineries adjusted to COVID-19-related decreases in petroleum product demand. Similarly, refinery receipts—the amount of crude oil delivered to Utah’s five refineries—decreased 14% to 60 million barrels. Estimated exports of Utah crude oil peaked in 2014 at 15 million barrels coinciding with a peak in production. With the drop in production in 2020, exports of Utah crude oil dropped to an estimated 5.8 million barrels.

Prices and Value The COVID-19 pandemic, coupled with price wars between Russia and Saudi Arabia, created turmoil in the international oil markets. Oil prices dropped significantly in early spring 2020, with futures prices briefly plunging below \$0 per barrel on April 20. These conditions rippled through Utah, where oil prices started the year just under \$50 per barrel, dropped to \$18 per barrel in May 2020, before rebounding to \$35–\$40 per barrel. Overall, Utah oil prices are estimated to average \$34 per barrel in 2020, down 30% from the 2019 price. The overall decrease in price, coupled with a resultant slowing of production, pushed the value of Utah’s produced crude oil down to \$1.1 billion in 2020, down 40% from 2019. Following suit, Utah’s average price for regular unleaded motor gasoline and diesel also decreased in 2020 to \$2.32 and \$2.50 per gallon, respectively.

Consumption Petroleum product demand plummeted in the spring of 2020 as travel restrictions and stay-at-home directives went into effect due to the COVID-19 pandemic. Utah’s refined petroleum product production reached record highs in 2019 at 80 million barrels but decreased 13% to 70 million barrels in 2020. Refined petroleum product imports from Wyoming via the Pioneer pipeline decreased 6% from 16

million barrels to 15 million barrels in 2020, and Utah refineries exported an estimated 28 million barrels of petroleum products via pipeline to other states. Utah’s total petroleum product consumption also reached record highs in 2019 at 61 million barrels but retreated in 2020 to 54 million barrels, 50% of which was motor gasoline and 30% diesel fuel.

Natural Gas

Production Utah’s natural gas production peaked in 2012 at 491 billion cubic feet (Bcf) but has since retreated to 245 Bcf in 2020, the lowest in the past 34 years. The 10% decrease in production between 2019 and 2020 is the result of continued low prices, lack of drilling, and a decrease in associated gas (natural gas produced from crude oil wells) as crude oil production dropped due to pandemic-related disruptions. Dry production and actual natural gas sales also decreased to 236 and 200 Bcf, respectively. Similarly, natural gas liquids production decreased to about 3.3 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 natural gas prices declined in 2015. With the sustained low natural gas prices, drill rigs in Utah are focused on liquid-rich plays with no significant drilling targeting natural gas since 2015.

Prices and Value The average wellhead price for natural gas in Utah decreased 24% in 2020 to about \$1.90 per thousand cubic feet (Mcf), the first-time prices have been below \$2 since 2002. Natural gas prices near \$2 per Mcf provide no economic justification for natural gas exploration or development. In contrast, the residential natural gas price increased over 8% in 2020 to \$8.45 per Mcf. Lower production of natural gas and natural gas liquids, coupled with the low prices, resulted in a 2020 natural gas production value of \$514 million, the lowest since 1999.

Consumption Natural gas consumption in Utah has been volatile over the past few years mostly due to large swings in the electric utility market. After reaching a record high of 264 Bcf in 2019, consumption decreased 5% in 2020 to 251 Bcf, including 9% decreases in the residential sector and

13% decreases in the commercial sector (possibly related to moderate winter temperatures in 2020). In contrast, consumption in the electric utility sector increased slightly (0.5%) in 2020. For the first time since the early 1980s, Utah consumed more gas than it produced in 2020 and is no longer a net-exporter.

Coal

Production At the end of 2020, Utah has six active coal mines, the fewest number since mining operations in Utah began nearly 150 years ago. Overall, coal production is expected to decrease by 8% in 2020 to 13.2 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 two remaining Wolverine mines—Skyline and Sufco—accounted for 63% (8.3 million tons) of Utah’s total coal production; Wolverine’s Dugout mine was idled in fall 2019 (production from this mine was minor, only about 500,000 per year, compared with Skyline and Sufco). Emery County Coal Resources took over ownership of the Lila Canyon mine in 2020 and produced 3.1 million tons of coal. Rhino Resources, the owner of the Castle Valley mines, went into bankruptcy in mid-2020 and its mines were bought by COP Coal Development, which produced 700,000 tons in 2020. The Coal Hollow mine in southern Utah ramped up production to 600,000 tons in 2020 from their surface mine after receiving long-sought federal coal leases. Bronco Energy’s Emery mine produced about 500,000 tons of coal in 2020, down slightly from the 700,000 tons produced in 2019.

Prices and Value The average mine-mouth price for Utah coal decreased slightly to about \$37 per short ton in 2020, still a relatively high price in nominal dollars but well below the inflation-adjusted high of \$103 per ton reached in 1976. The end-use price of coal at Utah electric utilities, which includes transportation costs, increased slightly to \$43 per ton in 2020. The value of coal produced in Utah totaled \$488 million in 2020, 10% lower than 2019, and well below the inflation-adjusted high of \$1.3 billion recorded in 1982.

Consumption Approximately 11 million short tons of coal was consumed in Utah in 2020, 97% of which was burned at electric utilities. Demand for coal in Utah dropped 17% between 2015 and 2016, then remained steady until 2020 when it dropped another 11%. Coal sales for industrial use mostly by cement and lime producers dropped to roughly 350,000 tons per year, a quarter of peak demand of 1.4 million tons reached in 2005. 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 down to about 1.5 million tons in 2020. Utah’s foreign exports peaked in the mid-1990s at about 5 million tons, then dropped to near zero in the mid-2000s. Demand from the foreign market has increased over the last decade, totaling an estimated 2 million tons in 2020; however, overseas transportation options are limited.

Electricity (Including Renewable Resources)

Production Electricity generation in Utah decreased 4.6% to 37,310 gigawatthours (GWh) in 2020, nearly all of which was a result of lower generation at Utah’s coal fired power plants. Overall, 2020 generation is about 20% below peak generation reached in 2008. Reductions in electricity generation over the past 12 years are the result of recession-related and pandemic-related decreases in demand, increased energy efficiency measures, an exponential increase in residential rooftop solar, and a reduction in demand for coal-fired generation from out-of-state users such as California. Coal-fired electric generation once dominated Utah’s electric portfolio, providing 94% of electric generation in 2005. In 2020, coal accounted for only 62% of electric generation; significant increases in natural gas generation (26%) and renewable sources (12%) 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 utility-scale solar capacity came online, more than wind, hydroelectric, geothermal, and biomass combined. By the end of 2020, an additional 400 MW of solar should be online with another 1000+ MW in development. Solar now accounts for 6.0% of Utah’s total electric generation. In contrast, Utah’s fleet of coal-fired power plants has experienced a nearly 40% reduction in net generation since 2008.

Prices The overall price of electricity in Utah has remained mostly steady over the past eight years. Utah's 2020 average electric rate of 8.4 cents per kilowatt-hour (kWh) for all sectors of the economy is 21% lower than the national average of 10.7 cents. This lower rate is mostly attributed to Utah's established fleet of coal-fired power plants, which still supply 62% of electricity generation in the state, as well as low natural gas prices. The residential price of Utah's electricity increased a modest 1.9% in 2020 to 10.6 cents per kWh, which is lower than the national average of 13.2 cents per kWh.

Consumption In general, from 1980 to 2013, electricity consumption averaged a 3.3% increase annually, mirroring Utah's population rate increase (2.1% per year) combined with the increasing rate of consumption per capita (1.3% per year). However, after an initial 1.4% decrease from 2013 to 2014, total electricity consumption climbed more slowly to reach a new record high in 2018 of 31,242 GWh, before falling 0.3% in 2019 and 0.8% in 2020. The slow-down in electricity consumption is related to the implementation of energy efficiency measures plus a dramatic increase in residential rooftop solar. Pandemic restrictions played a role in redistributing demand in 2020; residential demand increased 5.8% as Utahns spent more time at home, whereas commercial demand decreased 6.8% as many businesses had to temporarily close. Industrial demand stayed steady as industrial services continued through the shutdowns. Utah remains a net exporter of electricity, using 83% of in-state electric generation.

2021 OUTLOOK

Production and Consumption 2020 was dominated by the impact of the COVID-19 pandemic on Utah's energy industry. The uncertain outlook for 2021 will be determined by the availability and effectiveness of a vaccine and the eventual return to a more normal life. Oil prices in Utah will most likely linger in the low- to mid-\$30 range as uncertainty in the petroleum market continues; high enough for minor drilling but far from the prices needed for extensive oil field development and significant increased oil production. Demand for petroleum products is projected to increase in 2021 as travel restrictions are lifted and people feel more comfortable leaving their homes. Looking to the future, plans have been proposed to build a railway spur into the Uinta Basin; the federal Surface Transportation Board recently released a draft Environmental Impact Statement (EIS) that is currently (December 2020) out for public comment. If approved and financed, the proposed railway could open new out-of-state markets for Utah's crude oil, creating potential for increased crude oil production.

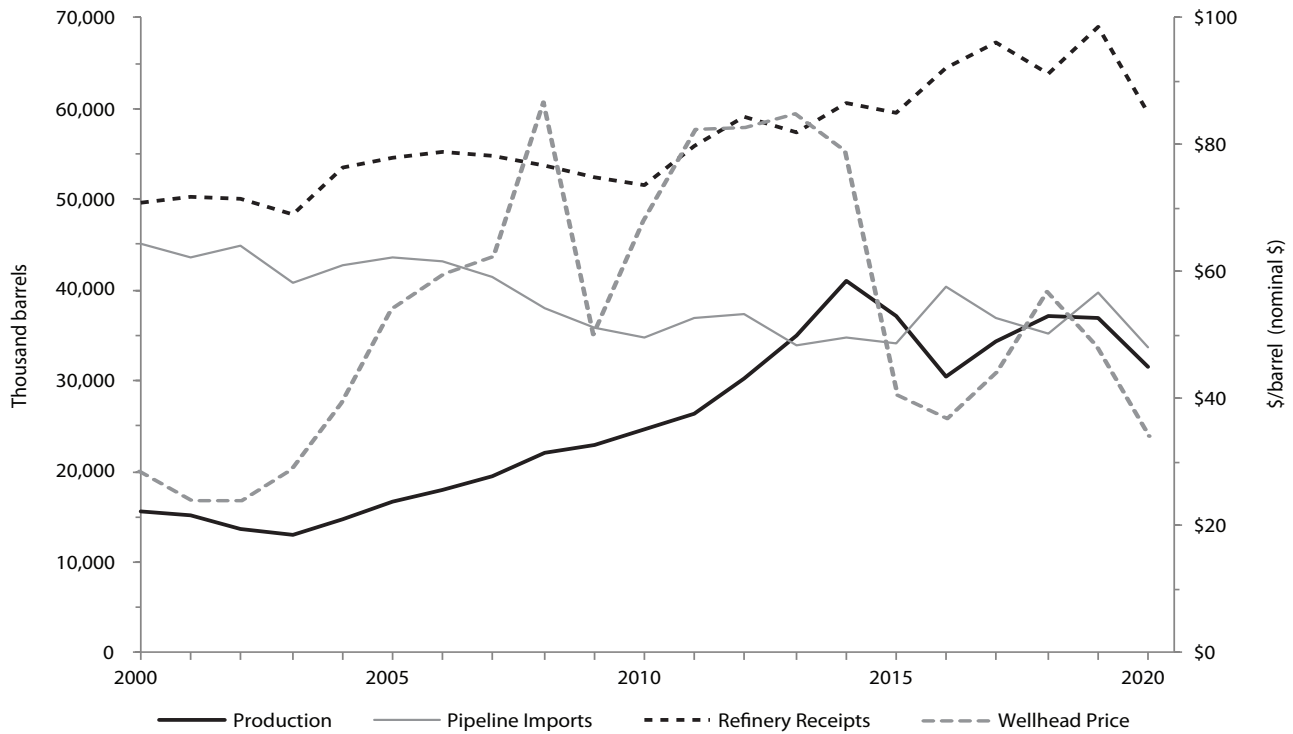
The COVID-19 pandemic exacerbated the problems faced by the already struggling natural gas industry. Production for natural gas in Utah will continue to fall, albeit not as sharply as years prior, as prices remain below \$3 per Mcf. Although Utah had record high consumption of natural gas in 2019, U.S. supply remains high and prices have stayed low. Several groups have sought new markets for Rocky Mountain natural gas to help alleviate the oversupply, including access to proposed liquefied natural gas (LNG) facilities in Oregon and Baja California, Mexico, to tap into Asian markets.

Coal production in Utah is expected to remain in the 13- to 14-million-ton per year range for the near future, as in-state demand has stabilized around 11 to 12 million tons a year, and out-of-state demand continues to be weak (less than 2 million tons per year). This current supply-demand balance will change in a few years when the coal-fired Intermountain Power Plant will convert to natural gas and hydrogen, removing demand for 3 to 4 million tons of coal from the Utah market. Utah coal deliveries to the foreign export market have experienced 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. West Coast port facilities are vital for accessing the Asian coal market, but current capacity at existing ports is limited and additional capacity could be a challenge to build.

Utah's electric generation portfolio continues to evolve as demand for carbon-neutral electricity increases and several new utility-scale solar farms are installed in 2021 and beyond. This intensified emphasis on renewable energy has spurred research and development into large-scale electric storage facilities (e.g., compressed air storage in salt domes near Delta, Utah), the generation of electricity from "renewable" natural gas sources (e.g., large-scale anaerobic digesters), the continued development of enhanced geothermal systems at the Frontier Observatory for Research into Geothermal Energy (FORGE) site in central Utah, and the production of carbon-neutral hydrogen for electricity generation or vehicle fuel. Consumption of electricity should only modestly increase in the next few years as more rooftop solar is installed (offsetting residential demand) and energy efficiency measures continue to offset demands from a growing population.

Prices Uncertainties linger about when and if crude oil prices might return to pre-pandemic levels. Utah prices will likely remain in the \$30–\$40 range for the foreseeable future as the worldwide supply-demand balance equilibrates. The price of natural gas has remained in the mid- to upper \$2-per-Mcf range for the past five years before dipping below \$2 in 2020. Projections indicate the price will likely stay in the \$2 to \$3 range. 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. Despite recent changes, Utah's well-established coal-fired power plants (which still provide 62% of Utah's electricity generation), as well as an established fleet of natural-gas plants and nearly 1.5 gigawatts of new solar capacity, will assure affordable, reliable electric power for the near future and keep Utah's electricity prices nearly 20% below the national average.

Figure 17.1: Utah's Crude Oil Production, Pipeline Imports, and Refinery Receipts Plotted with Wellhead Price, 2000–2020



Source: Utah Geological Survey, Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration, Baker Hughes (rig data)

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

Year	Supply ¹ (Thousand barrels)				Drilling Avg. # of rigs operating in Utah	Disposition (Thousand barrels)				Price Wellhead (\$/barrel)	Value Value of Utah Crude Oil (Million \$)
	UT Crude Prod.	CO Imports	WY Imports	Canadian Imports		Utah Crude Exports ²	Refinery Receipts	Refinery Inputs	Refinery Beginning Stocks		
2000	15,608	7,163	26,367	11,528	15	10,950	49,716	49,999	786	\$28.53	\$445
2001	15,271	7,208	25,100	11,364	21	8,633	50,310	50,143	457	\$24.09	\$368
2002	13,770	7,141	25,455	12,215	13	8,619	49,962	49,987	591	\$23.87	\$329
2003	13,096	6,964	24,152	9,690	14	5,635	48,267	48,284	547	\$28.88	\$378
2004	14,742	7,559	22,911	12,195	22	4,007	53,400	53,180	532	\$39.35	\$580
2005	16,675	8,214	24,372	10,991	28	5,739	54,513	54,544	767	\$53.98	\$900
2006	17,926	9,355	23,256	10,633	40	6,051	55,119	55,192	728	\$59.70	\$1,070
2007	19,534	10,708	22,012	8,769	41	6,258	54,764	54,952	662	\$62.48	\$1,220
2008	22,040	10,259	21,316	6,382	42	6,360	53,637	53,165	473	\$86.58	\$1,908
2009	22,941	7,409	23,000	5,520	18	6,395	52,475	52,479	519	\$50.22	\$1,152
2010	24,666	6,525	24,000	4,278	27	7,832	51,637	51,678	511	\$68.09	\$1,679
2011	26,276	6,997	26,050	3,894	28	7,318	55,900	55,656	473	\$82.53	\$2,169
2012	30,204	7,805	25,118	4,394	37	8,368	59,153	58,961	692	\$82.73	\$2,499
2013	35,002	7,601	23,124	3,111	29	11,493	57,345	56,921	669	\$84.79	\$2,968
2014	40,914	7,662	23,425	3,636	25	15,090	60,548	60,677	798	\$79.04	\$3,234
2015	37,136	7,048	22,211	4,963	7	11,809	59,549	59,568	660	\$40.69	\$1,511
2016	30,528	7,110	27,318	5,873	3	6,348	64,482	64,496	719	\$36.92	\$1,127
2017	34,438	5,763	26,187	4,967	9	4,043	67,311	67,526	826	\$44.24	\$1,524
2018	37,117	5,616	23,819	5,803	7	8,575	63,780	63,805	730	\$56.85	\$2,110
2019	36,934	5,253	26,059	8,308	6	7,487	69,067	69,033	821	\$48.32	\$1,785
2020e	31,600	4,800	22,000	6,900	3	5,800	59,500	60,300	978	\$34.00	\$1,074

e = estimate

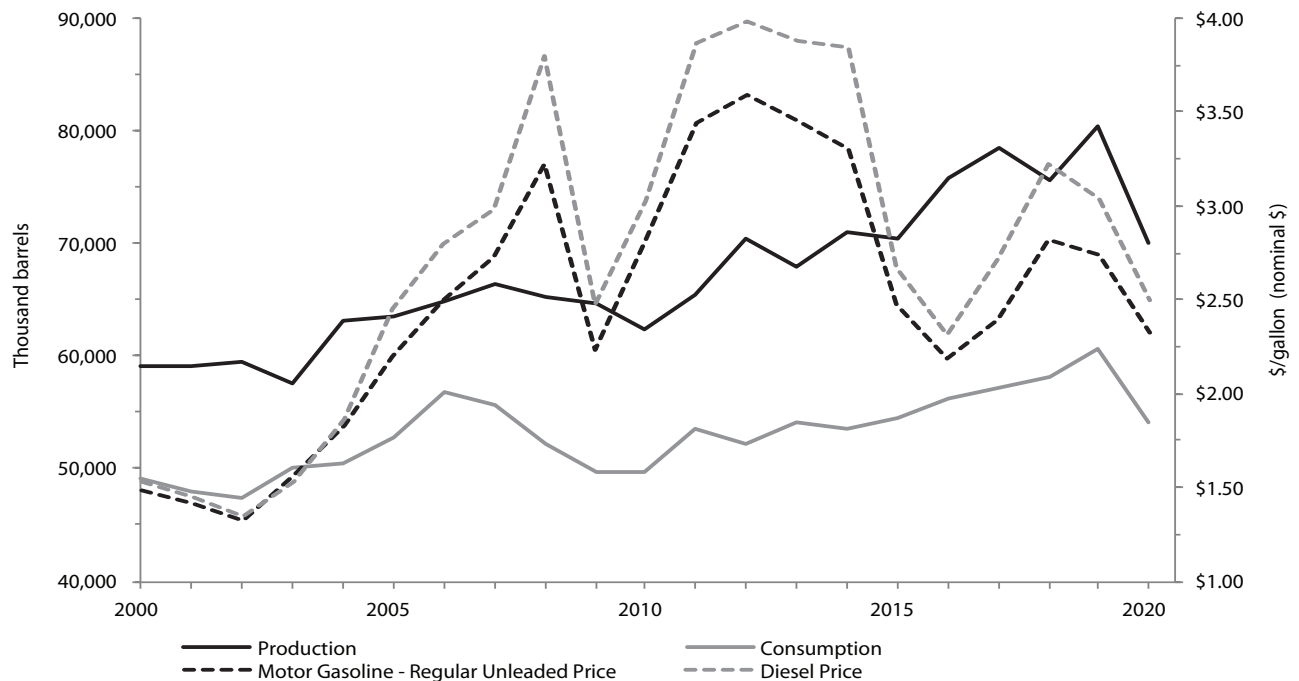
¹Out-of-state imports only include pipeline shipments; minor imports may arrive by truck, and additional minor imports may come from other states.

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

Note: Prices and values are in nominal dollars.

Source: Utah Geological Survey; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration, Baker Hughes (rig data)

Figure 17.2: Utah's Petroleum Product Production and Consumption Plotted with Motor Gasoline and Diesel Prices, 2000–2020



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

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

Year	Supply (Thousand barrels)			Consumption by Product (Thousand barrels)					Exports Pipeline Exports to Other States ^{1,3} (Thousand barrels)	Prices (\$/gallon)	
	Refined Product Production	Refinery Beg. Stocks	Refined Prod. Pipeline Imports ^{1,2}	Motor Gasoline	Jet Fuel	Distillate Fuel	All Other	Total		Motor Gasoline - Regular Unleaded	Diesel
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	6,366	49,709	21,490	\$2.82	\$3.03
2011	65,369	2,689	11,383	25,568	5,767	15,448	6,771	53,554	23,058	\$3.44	\$3.87
2012	70,456	2,860	13,316	25,228	5,572	14,776	6,693	52,269	26,695	\$3.59	\$3.98
2013	67,892	3,077	15,204	26,085	6,399	15,317	6,361	54,162	26,654	\$3.45	\$3.88
2014	70,931	2,676	13,853	26,469	5,716	15,169	6,263	53,617	27,260	\$3.30	\$3.85
2015	70,385	2,980	16,615	27,776	6,204	14,293	6,157	54,430	28,972	\$2.47	\$2.67
2016	75,780	2,771	16,402	28,535	6,944	14,248	6,564	56,291	30,966	\$2.19	\$2.31
2017	78,473	2,652	15,530	28,769	6,678	15,043	6,743	57,233	32,666	\$2.39	\$2.71
2018	75,506	2,918	15,876	28,725	7,080	15,700	6,647	58,152	31,164	\$2.82	\$3.22
2019*	80,371	2,762	16,370	30,100	7,555	16,000	6,900	60,555	33,025	\$2.74	\$3.04
2020e	70,000	3,316	14,900	27,300	4,600	15,900	6,300	54,100	27,900	\$2.32	\$2.50

*Consumption was estimated.

e = estimate

1. Amounts shipped by truck are unknown.

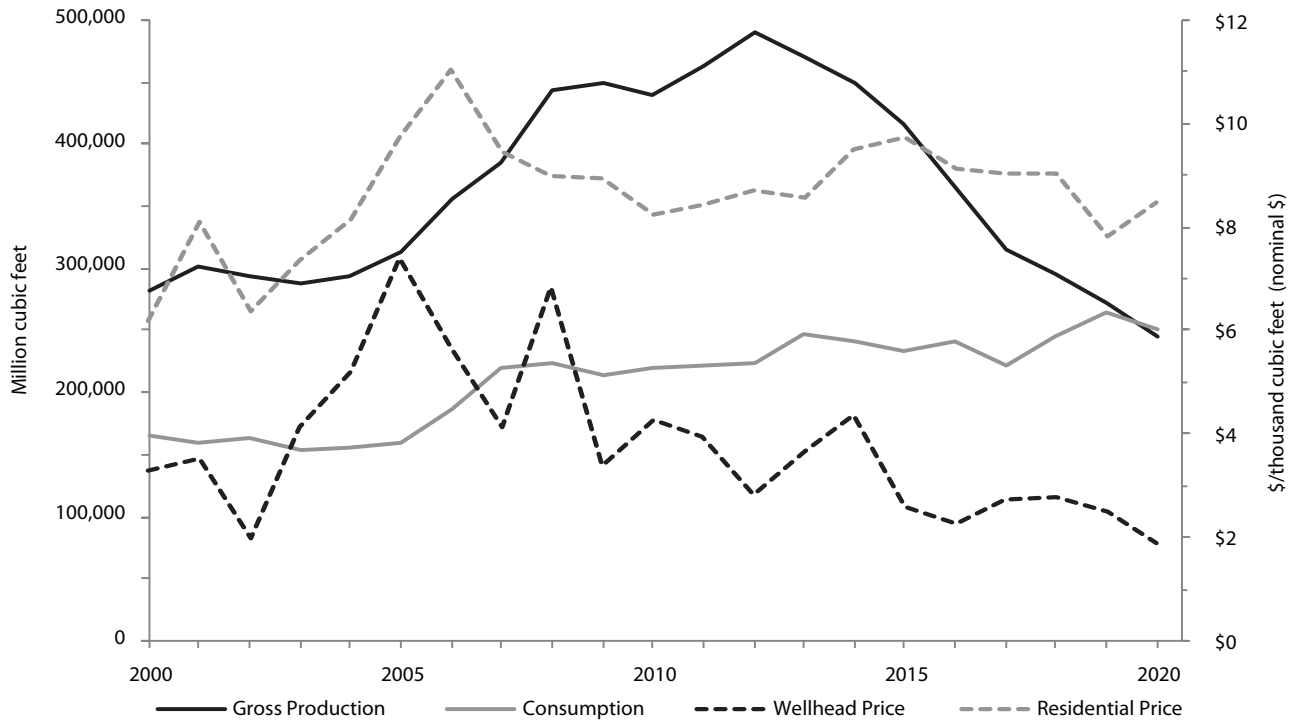
2. The Pioneer pipeline, originating from Sinclair, Wyoming, is the only pipeline importing petroleum products into Utah.

3. Prior to 2012, only the Chevron Petroleum pipeline exported product to the northwest (Idaho and Washington); in 2013 this line was sold to Tesoro. 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).

Note: Prices are in nominal dollars.

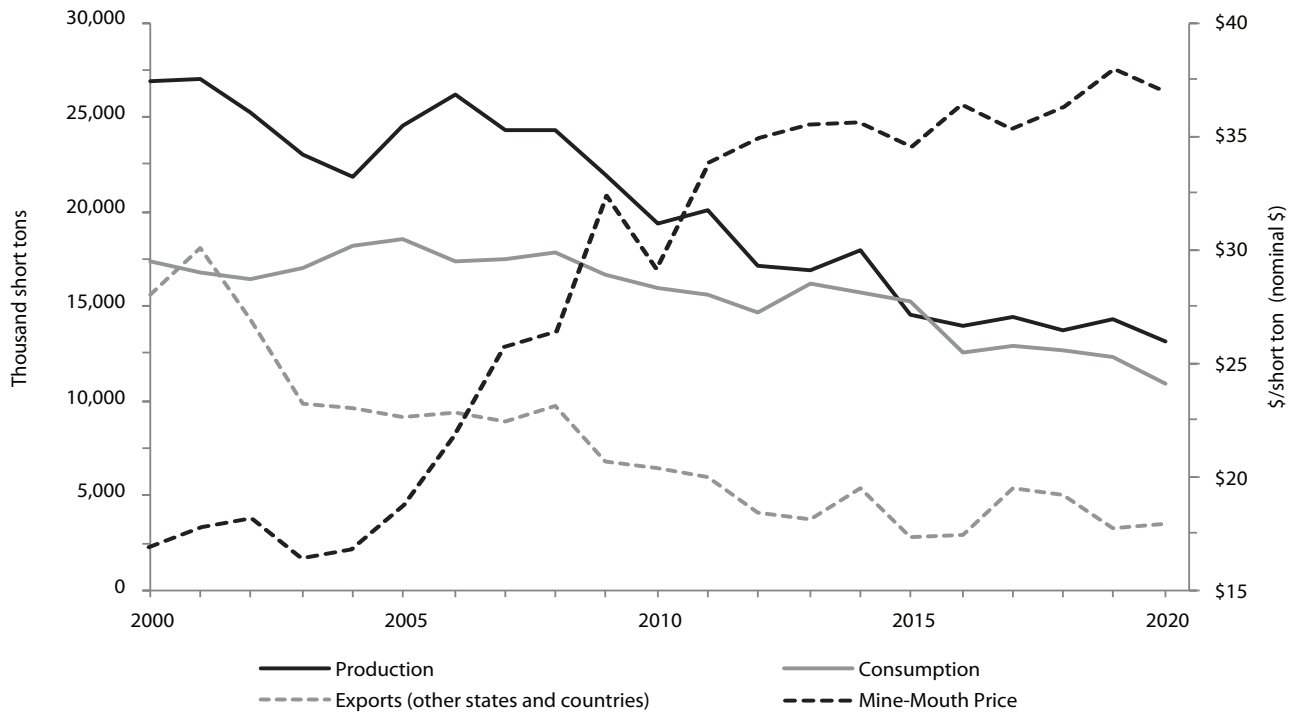
Source: Utah Geological Survey, U.S. Energy Information Administration, Federal Energy Regulatory Agency

Figure 17.3: Utah's Natural Gas Production and Consumption Plotted with Wellhead and Residential Prices, 2000–2020



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

Figure 17.4: Utah's Coal Production, Consumption, and Exports Plotted with Mine-Mouth Price, 2000–2020



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

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

Year	Production				Consumption by End Use (Million cubic feet)								Prices (\$/thousand cubic feet)					Value (Million \$)
	Gross Production (Million cubic feet)	Dry Production (Million cubic feet)	Actual Sales (Million cubic feet)	Natural Gas Liquids Production (Thousand bbl)	Residential	Commercial	Vehicle Fuel	Industrial	Electric Utilities	Lease, Plant, & Pipeline	Total	Wellhead	End-Use Residential	End-Use Commercial	End-Use Industrial	Natural Gas Liquids (\$/bbl)		
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	490,575	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	470,349	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	450,024	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	417,023	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	365,281	352,437	319,056	5,573	63,929	39,066	305	38,568	59,684	38,562	240,114	\$2.24	\$9.12	\$7.43	\$5.52	\$25.51	\$932	
2017	315,197	304,266	278,015	4,813	66,700	41,264	354	40,007	40,830	32,679	221,834	\$2.72	\$9.05	\$7.40	\$5.51	\$31.94	\$981	
2018	295,825	284,264	249,763	3,817	67,415	42,367	348	39,935	61,161	32,831	244,057	\$2.77	\$9.04	\$7.37	\$5.31	\$46.33	\$964	
2019	272,752	262,219	218,137	3,975	75,938	47,336	324	41,348	67,774	31,328	264,048	\$2.50	\$7.82	\$6.35	\$5.00	\$23.97	\$751	
2020e	245,000	236,000	200,000	3,300	69,400	41,200	390	40,300	68,100	31,500	250,890	\$1.90	\$8.45	\$6.90	\$5.10	\$20.00	\$514	

e = estimate

NG = natural gas, NGL = natural gas liquids, bbl = barrels

Note: Prices and values are in nominal dollars.

Source: Utah Geological Survey; Utah 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

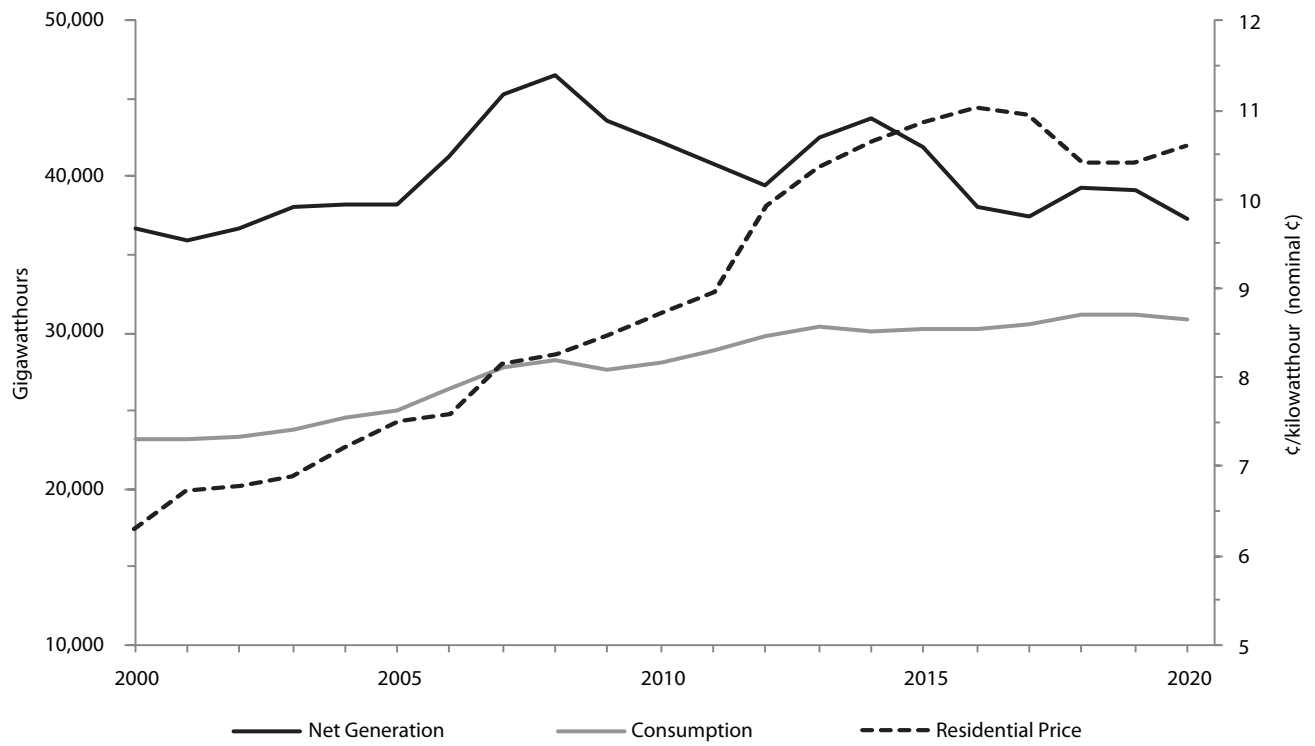
Year	Supply (Thousand short tons)		Distribution (Thousand short tons)	Consumption by End Use (Thousand short tons)				Exports (Thousand short tons)		Prices (\$/short ton)		Value (Million \$)	
	Production	Imports		Total Distribution of Utah Coal	Residential & Commercial	Coke Plants	Other Industrial	Electric Utilities	Total	To Other U.S. States	To Canada and/or Overseas		Mine Mouth
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	\$41.84	\$599
2013	16,953	1,864	16,896	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	\$42.12	\$501
2016	13,978	1,908	14,620	0	0	575	12,001	12,576	1,890	1,049	\$36.40	\$41.36	\$509
2017	14,417	2,314	15,020	0	0	485	12,438	12,923	2,242	3,123	\$35.28	\$41.56	\$509
2018	13,753	1,907	14,084	0	0	378	12,332	12,710	1,907	3,148	\$36.31	\$42.83	\$499
2019	14,347	1,800	13,496	0	0	382	11,891	12,273	2,071	1,228	\$37.95	\$41.77	\$544
2020e	13,200	2,000	13,300	0	0	350	10,600	10,950	1,500	2,000	\$37.00	\$43.46	\$488

e = estimate

Note: Prices and values are in nominal dollars.

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, 2000–2020



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 (Gigawatthours)										Consumption by End Use (Gigawatthours)				Residential Consumption Per Capita (MWh/person)	Prices by End Use (¢/kilowatthour)			
	Coal	Petroleum	Natural Gas	Hydro	Geo-thermal	Wind	Solar	Biomass ¹	Other ²	Total	Residential	Commercial	Industrial	Total		Residential	Commercial	Industrial	All Sectors
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	3.05	11.0	8.7	6.1	8.6
2018	25,912	37	8,724	927	446	795	2,224	79	232	39,375	9,715	12,135	9,393	31,242	3.07	10.4	8.2	5.9	8.2
2019	25,241	40	9,369	875	310	819	2,186	71	206	39,117	9,740	11,912	9,491	31,143	3.02	10.4	8.3	6.0	8.2
2020e	23,200	40	9,600	930	350	750	2,250	80	110	37,310	10,300	11,100	9,500	30,900	3.15	10.6	8.5	6.0	8.4

e = estimate

MWh = megawatthours

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.

Note: Prices are in nominal dollars.

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

Andrew Rupke, Utah Geological Survey
Stephanie Mills, Utah Geological Survey

2020 SUMMARY

The Utah Geological Survey (UGS) projects an estimated gross production value of metallic and industrial mineral commodities of \$3.3 billion in 2020, a decrease of about 4% from the \$3.4 billion value in 2019. However, 2020 projections come with higher than normal uncertainty because of the COVID-19 pandemic.

The U.S. Geological Survey reports the 2019 value of Utah's nonfuel (metallic and industrial) minerals production ranks seventh nationally, accounting for 3.9% of the total U.S. nonfuel minerals production. The UGS's 2020 production values are derived primarily from annual industry production surveys, corporate quarterly reports, and discussions with mining industry professionals.

Utah's 2020-estimated \$3.3 billion total includes a metals value of \$1.9 billion (58%) and an industrial minerals value of \$1.4 billion (42%). Utah's base metal production includes copper, molybdenum, magnesium, and beryllium 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, sand and gravel, crushed stone, portland cement, lime, limestone, phosphate, gilsonite, gypsum, and a variety of other mineral products.

Rio Tinto's Bingham Canyon open-pit mine remains the most important contributor to base and precious metal production in the state. Bingham is consistently the leading producer of copper and gold in Utah, and in 2019 was the only producer of silver and molybdenum. In December 2019, Rio Tinto announced a \$1.5 billion investment in a second phase of the south wall pushback, the first \$900 million phase of which is due to be completed in 2021. The second phase of the south wall pushback is expected to extend mine life to 2032. Both mined and refined copper production in 2020 were strongly impacted by the Magna earthquake in March, which damaged the flash converting furnace. The furnace required a full

rebuild, and the smelter was also shut down for planned maintenance from May to June, after which there were delays restarting. Maintenance and repairs are now complete, and the refinery stream is expected to return to previous capacity by the end of the year. As a result of variable copper and precious metal grade in the current east wall mining and the extended smelter shut down, mined copper output has dropped by nearly one-third and refined copper output has dropped by over two-thirds. Copper and precious metal grades are expected to remain low until mining shifts to the south wall in 2021, though high molybdenum grade and recovery from the east wall will help offset the decrease in copper grade.

Lisbon Valley copper mine produced minor copper in 2019 from reprocessing existing leach pad material. No active mining took place. Future mine plans focused on progressing a plan for in-situ mining, which would allow mining of deeper parts of the ore body. However, in March 2020 funding for the mine fell through and the mine was abruptly shut down, resulting in a repeal of active mining permits and access of the surety bond to prevent any environmental damage from the cessation of operations. Lisbon Valley Mining Company has since secured funding and is currently reapplying for a mine permit with intentions to begin operations again in 2021.

US Magnesium continues to be the only producer of magnesium metal in the United States but is currently producing below capacity due in part to the 2016 closure of the adjacent titanium plant, an important consumer of magnesium. Materion Resources' Spor Mountain mining district in Juab County continued as a global leader of beryllium, producing 65% of global beryllium in 2019. Beryllium production is expected to remain relatively consistent in 2020 and 2021.

Based on available information and company projections, change in production of most

industrial mineral commodities from 2019 to 2020 will not be significant. However, U.S. Geological Survey data for the first half of 2020 indicate that construction aggregate production in Utah was up significantly (nearly 22%) compared to the first half of 2019. Construction aggregate, consisting of sand and gravel and crushed stone, is one of the more significant commodities in Utah and is an indicator of the overall construction market. However, the increase in aggregate production in the first half of 2020 is likely to be tempered somewhat in the second half of 2020 by the pandemic. If the construction industry experiences significant slowing due to the pandemic some of Utah's other industrial mineral markets such as cement, lime, and gypsum could experience decreases as well.

Metals exploration experienced significant disruption with the onset of the COVID-19 pandemic in early 2020; however, given improved commodity prices, many projects restarted by summer. Major drilling programs have taken place in the San Francisco, greater Tintic, Deer Trail, and Drum Mountain districts (Beaver, Juab, and Piute Counties) with additional active exploration projects in Emery, Garfield, Grand, Iron, Utah, Millard, Salt Lake, San Juan, Tooele, and Washington Counties. Overall exploration drilling footage is expected to increase from 2019 to 2020. Base and precious metals exploration, particularly for copper and gold, remains consistently active in Utah, and there was an increase in exploration activity for vanadium and uranium projects in 2020.

After completing significant permitting milestones in 2018 and 2019, including receiving a Record of Decision from the U.S. Bureau of Land Management, Crystal Peak Minerals' potash project at Sevier Lake in Millard County failed to attract sufficient capital investment to move the project forward and meet contractual requirements of a major creditor. Crystal Peak Minerals' plan for the project was to produce potassium sulfate, a more valuable type of potash than the typical potassium chloride. The future of the project is unclear. Earlier in the decade, several potash exploration projects were active in Utah, but interest in potash overall has waned due to lower prices and changing market dynamics.

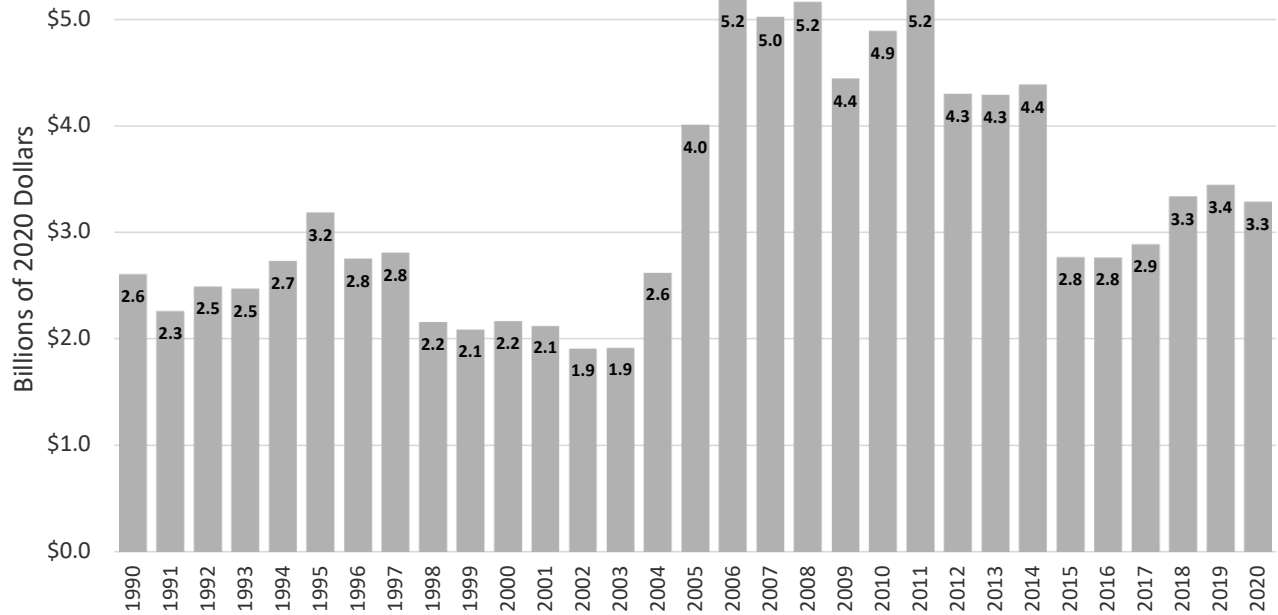
Other industrial mineral exploration and development in Utah has focused on fluorspar, frac sand, and lithium. Utah is poised to become the nation's

only producer of fluorspar, a designated critical mineral. Ares Strategic Mining is reviving the Lost Sheep Mine, Utah's largest historical producer of fluorspar. They are working towards expanding the resource at the mine and restarting production. Interest in frac sand is a response to the oil and gas industry's trend of using increasing amounts of sand in hydraulic fracturing of wells. Several areas in Utah have been investigated for frac sand resources in recent years, but current interest is focused on the Uinta Basin. One project near Vernal began producing in late 2019 and other potential deposits in the area are being investigated. Recent reductions in oil demand may slow development of other projects. Due to rising demand and prices at the time, a brief lithium boom led to several thousand lithium claims being filed in 2016 and 2017 on Utah BLM land, but activity has dropped off since then. However, one company, Anson Resources, continues to pursue a potential lithium resource in subsurface brines of the Paradox Basin. Anson has been re-entering old oil and gas wells in the Paradox Basin to test lithium concentrations in brines with some success. Globally, interest in lithium projects has waned as existing large producers and advanced exploration projects in Australia and South America increase production and move toward development.

2021 OUTLOOK

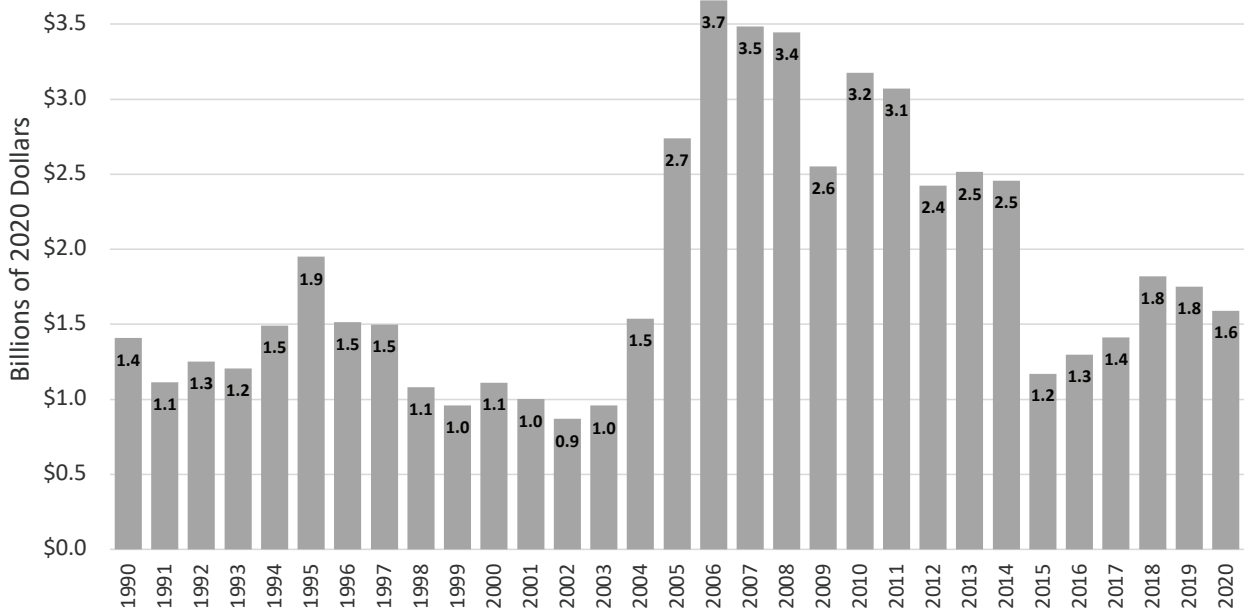
Access to higher grade ore at Bingham Canyon in 2021 due to the shift from east wall to south wall mining will drive increased metal production in 2021 and beyond. If approved for in-situ mining, Lisbon Valley will also resume active copper production. The strong price of gold and copper are likely to drive small-scale precious metal mining operations and stabilize or slightly increase metals exploration expenditure in 2021. Major swings in production and commodity prices are not expected for industrial minerals in 2021, but continued pandemic-related slowdowns or post-pandemic booms are possible. In summary, the UGS estimates that the gross production value of Utah's metallic and industrial mineral commodities in 2021 will be higher than 2020 totals driven by higher production at the Bingham Canyon mine and possible resumption of smaller-scale base and precious metal operations.

Figure 18.1: Total Value of Utah's Annual Metallic and Industrial Mineral Production



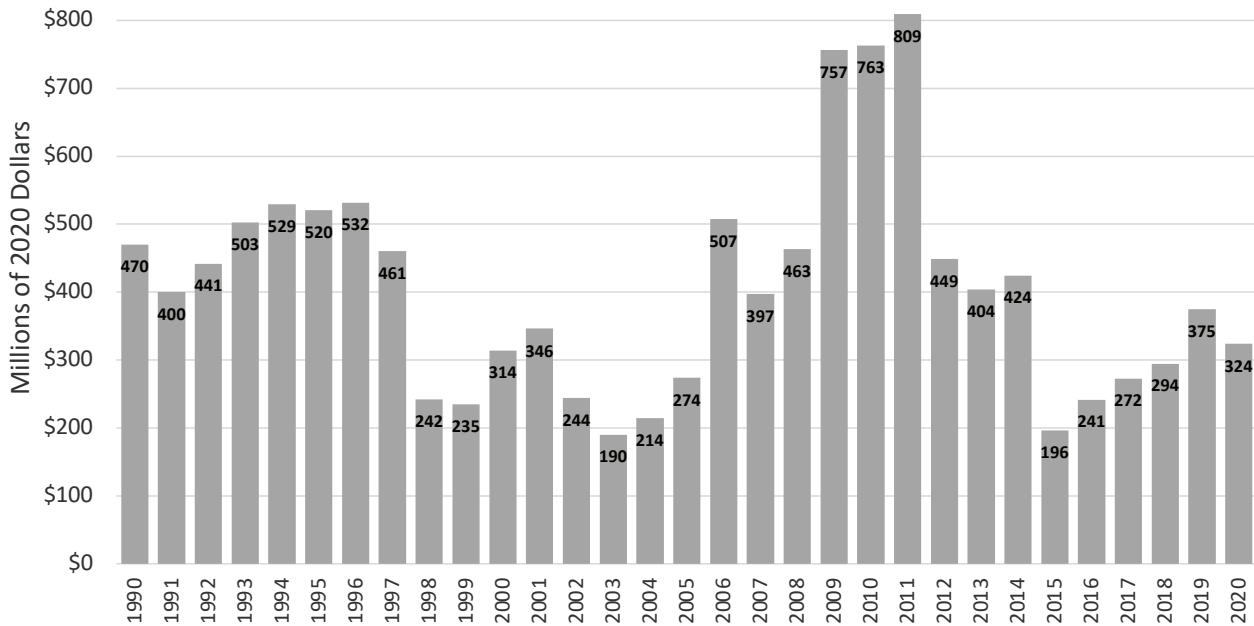
Note: The value presented for 2020 is an estimate.
Source: Utah Geological Survey.

Figure 18.2: Value of Utah's Annual Base Metal Production



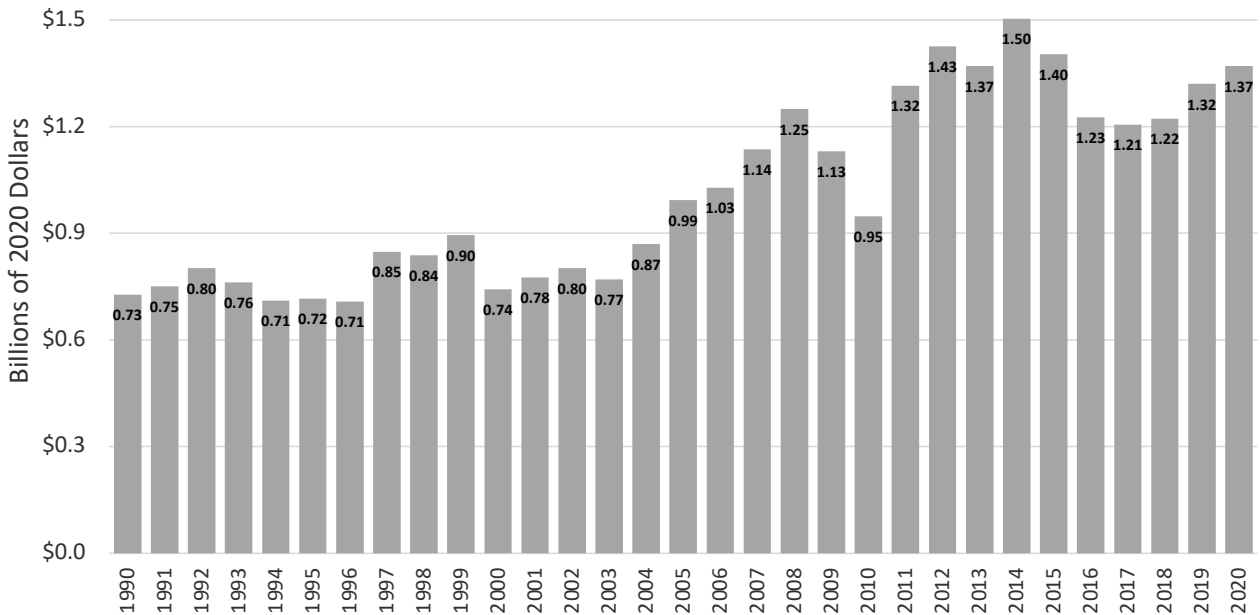
Note: The value presented for 2020 is an estimate; Copper production value for 2020 (part of total base metals value) is calculated from mined copper.
Source: Utah Geological Survey.

Figure 18.3: Value of Utah’s Annual Precious Metal Production



Note: The value presented for 2020 is an estimate.
Source: Utah Geological Survey.

Figure 18.4: Value of Utah’s Annual Industrial Mineral Production



Note: The value presented for 2020 is an estimate.
Source: Utah Geological Survey.