Energy

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Energy is defined as the ability to do work. The ability to change energy from one form to another underpins the economy's ability to create and deliver goods and services. Different energy sources present different tradeoffs, such as reliability, cost, and sustainability.

CHAPTER SUMMARY

Utah is fortunate to have abundant and diverse energy resources, including large reserves of conventional fossil fuels as well as several areas suitable for renewable resource development. More recently, Utah witnessed an evolution in its energy landscape. Crude oil and natural gas still feature prominently in Utah's energy mix, but each year coal has a more diminished role. The electricity market continues to adjust to decarbonization pressures balanced with grid reliability and affordability. This energy evolution will continue with ongoing emphasis on renewable and carbon-neutral energy sources, innovations in the hydrogen economy, and electrification of the transportation system.

YEAR IN REVIEW

The energy economy is still reacting to lingering impacts from the post-COVID-19 run up in energy demand and lingering high energy prices. In addition, continued geopolitical situations (e.g., war in Ukraine, conflicts in the Middle East, etc.) kept petroleum and natural gas prices volatile and high. These high prices, coupled with consistently strong demand, resulted in continued local drilling and production of oil and natural gas, particularly in the Uinta Basin. Furthermore, the federal administration maintains a strong emphasis on a transition to carbon-neutral energy sources, most acutely seen in the electric utility sector with a continued shift away from coal to renewable resources.

Utah crude oil prices in 2023 fluctuated between $65 and $75 per barrel, averaging $67.50 for the year. Although this price is about 17% lower than in 2022, Utah crude oil production increased 16% to 52.5 million barrels in 2023, the highest annual production on record. Natural gas prices were volatile in late 2022 and early 2023, spiking up to $28 per thousand cubic feet (Mcf) before settling back down to the $3 range, resulting in an average 2023 price of $7.40 per Mcf. These high natural gas prices, coupled with projected record high demand, led to a second year of production increases resulting in a total 2023 production of 280 billion cubic feet (Bcf).

Utah's central-west desert (Millard, Beaver, and Iron counties) has been labeled "Utah's Renewable Energy Corridor" with large-scale development of solar, wind, and geothermal resources. Major investment in the Intermountain Power Project (IPP) site will facilitate electricity generation from natural gas and carbon-neutral hydrogen (IPP Renewed). In addition, research and development of enhanced geothermal resources cements the area's reputation as a clean energy hub. Several new utility-scale solar facilities will boost Utah's total solar capacity to 2.3 gigawatts (GW), or about 75% of total renewable electric capacity. New utility-scale capacity elevated solar to 11% of Utah's total electricity generation. In the residential sector, total installed photovoltaic (PV) capacity increased from 6 megawatts (MW) in 2013 to 433 MW in 2022. Electricity generation in Utah from all sources decreased 13% in 2023 despite consumption staying near a record high of 32,950 gigawatt hours (GWh). Electricity prices increased in 2023 but are still 30% lower than the national average.

Utah coal production dropped to the lowest level in over 45 years, 7.8 million tons in 2023 (27% less than 2022), despite a significant increase in coal prices. This decrease stemmed from underground problems at the Lila Canyon (which has been indefinitely idled as of fall 2023) and Skyline mines.

Also, the Coal Hollow mine in southern Utah was idled in mid-2023. Utah production decreases led to local coal shortages that necessitated near-record coal imports from Colorado and Wyoming. Coal demand at Utah power plants decreased from 12 million tons in 2021 to 8 million tons in 2023. The establishment of a foreign export coal market to meet high international demand continues to be a challenge as access to West Coast ports remains in question.

Demand for oil and natural gas remained strong in 2023 and will continue to play a major role in Utah's energy landscape. However, there is a noticeable shift at the federal level to move more quickly to carbon-neutral energy sources. Fortunately, Utah is well positioned to take the lead in this energy transition with major research projects focused on geothermal energy, hydrogen technology, carbon sequestration opportunities, and utility-scale storage, as well as the continued buildout of large-scale PV solar farms that are starting to be coupled with innovative battery storage.

2024 OUTLOOK

Crude oil prices in Utah will likely remain volatile but relatively high in 2024, in the upper-$60 to low-$70 per barrel range as demand continues to grow and geopolitical situations influence global prices. Oil prices in this range will continue to support 8 to 10 drill rigs in the Uinta Basin, almost exclusively drilling long-reach horizontal oil wells. However, in the short term, natural gas off-take options (oil production from new wells cannot commence until an operator secures a plan for bringing the associated natural gas to market) and crude oil transportation constraints place a ceiling on higher crude oil production. Fortunately, additional natural gas pipeline capacity in the Uinta Basin is expected to come online in mid-2024, enabling operators to increase crude oil production in 2H 2024 to as high as 175,000 barrels per day. For comparison's sake, 2H 2023 Uinta Basin production was about 135,000 barrels per day. The proposed Uinta Basin railway recently suffered a legal setback, but developers are determined to push forward. In the meantime, Uinta Basin operators truck crude oil to trans-loading terminals in Price, Utah, for unit trains headed to the Gulf Coast.

Oil and gas exploration/development elsewhere in Utah will likely remain minor compared with drilling in the Uinta Basin, but the increase in crude oil prices spurred some interest in the Paradox Basin (e.g., Cane Creek play) and the central Utah thrust belt. Projections show demand for petroleum products in Utah will stay near record highs in 2024 and continue this upward trend into 2025. Petroleum demand reductions based on the electrification of Utah's transportation sector will take years to materialize as electric vehicles still account for less than 1% of total vehicle registrations.

Several years of sub-$3 per Mcf natural gas prices caused stagnation in Utah's natural gas production industry, resulting in the lowest production levels since the 1980s. However, in late 2021 and continuing into 2023, the price of natural gas experienced significant swings resulting in average prices near $7 per Mcf. These higher prices facilitated the return of drill rigs that specifically target natural gas reservoirs, with up to four rigs drilling gas wells in the Uinta Basin in 2023. However, national benchmark prices for natural gas started dropping in mid-2023 and it is unclear how long these lower prices might last (prices are predicted to be in the $2 to $4 range in 2024). The lower prices already resulted in falling rig counts, as currently (December 2023) only one rig remains drilling for gas in the Uinta Basin.

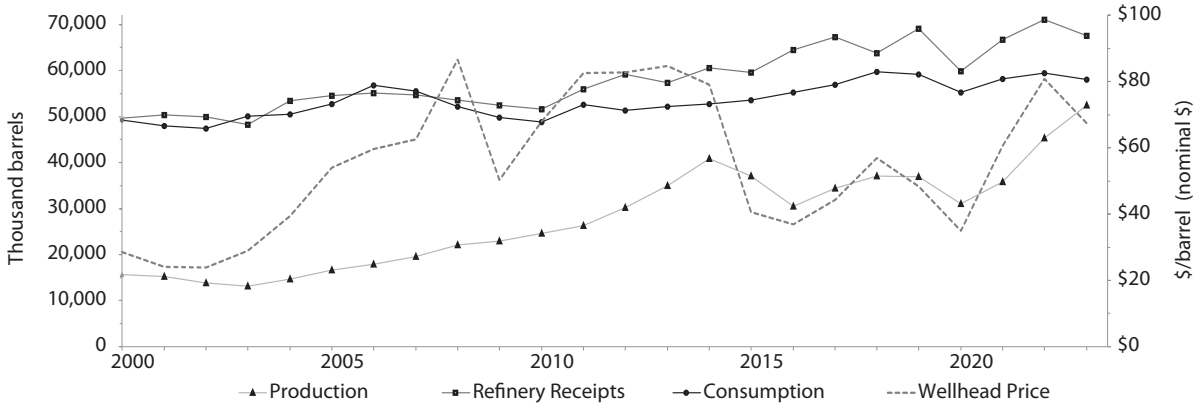
Coal production in Utah is expected to increase only slightly in 2024 to about 8.0 million tons. Production losses from the idling of the Lila Canyon and Coal Hollow mines could be somewhat offset by the possible opening of a new mine in the Trail Mountain area. However, even with relatively strong local demand for coal currently, active Utah mines find it difficult to ramp up production. The current supply-demand balance will change starting in 2025 when the coal-fired Intermountain Power Plant converts to natural gas and eventually hydrogen, removing demand for 2 to 3 million tons of coal. Utah coal deliveries to the foreign export market experienced a modest jump in recent years and potential remains for access to a strong overseas market that could partially replace falling domestic demand. However, West Coast port facilities are vital for accessing the Asian coal market, but current capacity at existing ports is limited and additional capacity is unlikely.

Utah's electric generation portfolio will continue to evolve as demand for carbon-neutral electricity increases and new utility-scale solar farms are installed in 2024 and beyond. This intensified emphasis on carbon-neutral energy sources has spurred research in:

1. Large-scale electric storage facilities (e.g., generation of carbon-neutral hydrogen coupled with underground storage, underground compressed air, pumped hydroelectric facilities, and more traditional utility-scale battery storage),
2. Enhanced geothermal systems at the Frontier Observatory for Research in Geothermal Energy (FORGE) site in central Utah as well as traditional geothermal resources,
3. Production of carbon-neutral hydrogen for electricity generation and vehicle fuel, and
4. Next-generation nuclear energy facilities (e.g., molten salt, etc.).

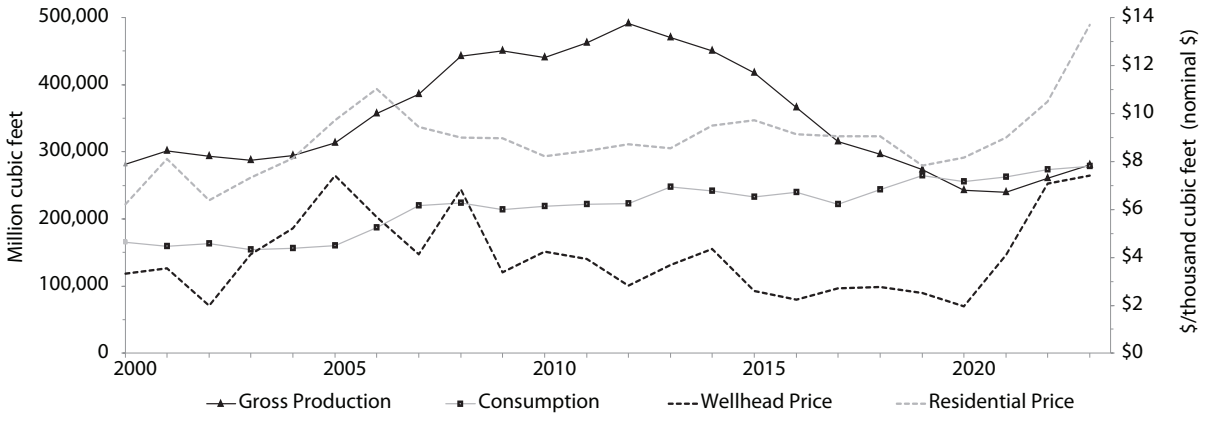
Electricity consumption will remain high, but Utah is fortunate to have electricity prices 30% below the national average.

Figure 18.1: Utah's Crude Oil Production, Refinery Receipts, and Petroleum Consumption Plotted with Crude Oil Wellhead Price, 2000–2023



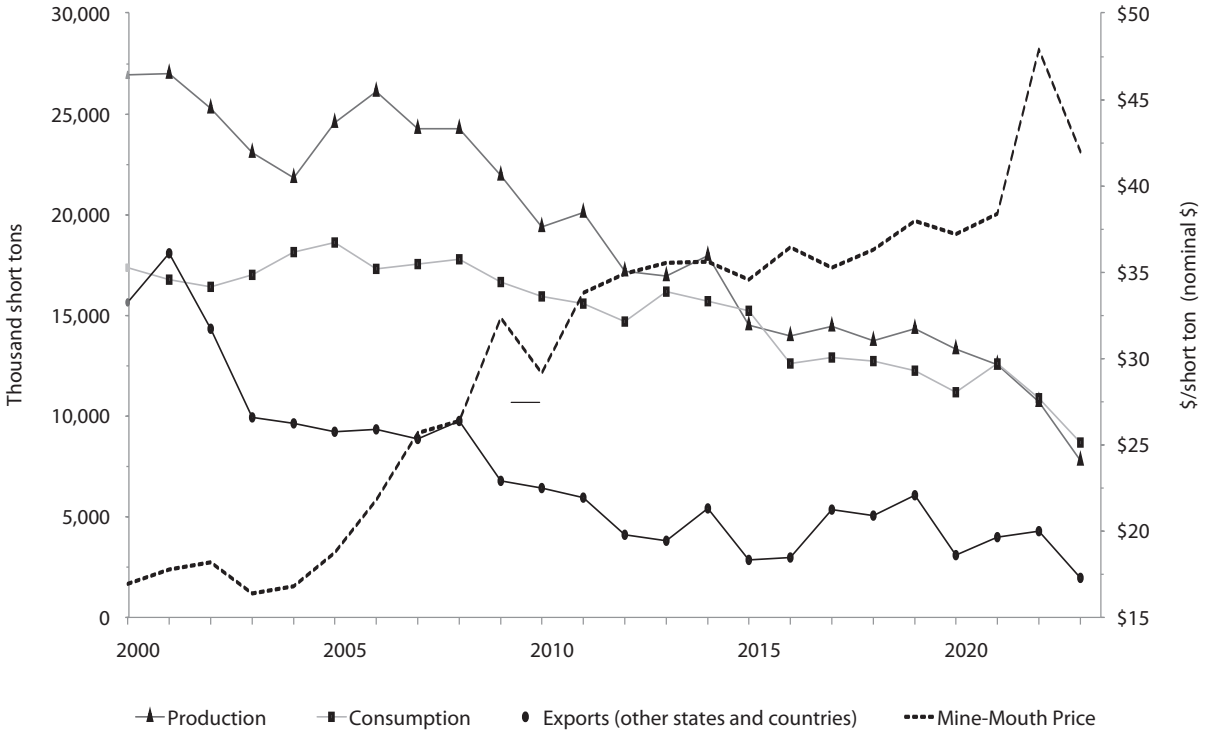
Source: Utah Geological Survey; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration, Baker Hughes (rig data)

Figure 18.2: Utah's Natural Gas Production and Consumption Plotted with Wellhead and Residential Prices, 2000–2023



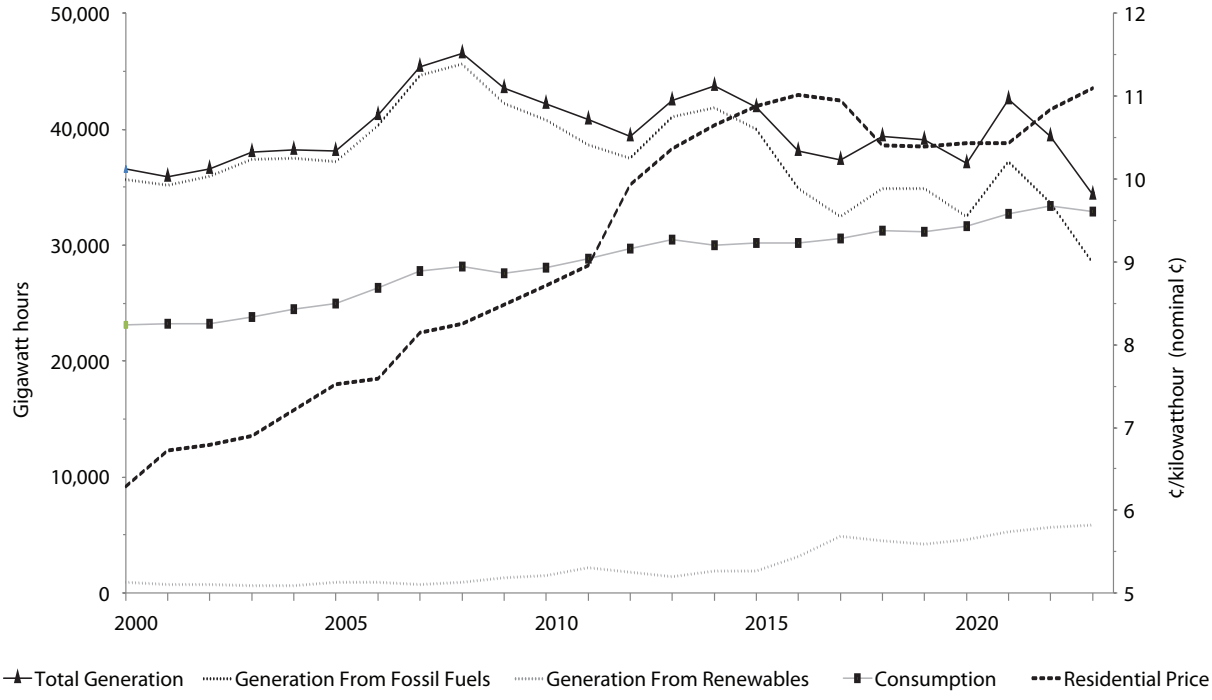
Source: Utah Geological Survey; Utah Tax Commission; Utah Division of Oil, Gas and Mining; U.S. Energy Information Administration

Figure 18.3: Utah's Coal Production, Consumption, and Exports Plotted with Mine-Mouth Price, 2000–2023



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

Figure 18.4: Utah's Electricity Net Generation and Consumption Plotted with End-Use Residential Price, 2000–2023



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

Table 18.1: Supply, Disposition, Prices, and Value of Crude Oil and Petroleum Products in Utah, 2000-2023e

	Crude Oil Production and Imports[1]				Drilling	Refining		Exports	Consumption by Product					Prices			Value
Year	Utah Crude Production	Colorado Imports	Wyoming Imports	Canadian Imports	Average # of rigs operating in Utah	Crude Oil Refinery Receipts	Refined Product Production	Utah Crude Oil Exports[2]	Motor Gasoline	Jet Fuel	Distillate Fuel	All Other	Total	Wellhead	Motor Gasoline - Regular Unleaded	Diesel	Value of Utah Crude Oil
	Thousand Barrels					Thousand Barrels		Thousand Bbls	Thousand Barrels					$/Barrel	$/Gallon	$/Gallon	Million $
2000	15,608	7,163	26,367	11,528	15	49,716	59,125	10,950	23,895	7,701	10,629	6,954	49,179	$28.53	$1.48	$1.53	$445
2001	15,271	7,208	25,100	11,364	21	50,310	59,094	8,633	22,993	6,880	11,236	6,904	48,013	$24.09	$1.41	$1.45	$368
2002	13,770	7,141	25,455	12,215	13	49,962	59,514	8,619	24,158	6,416	11,482	5,394	47,450	$23.87	$1.32	$1.34	$329
2003	13,096	6,964	24,152	9,690	14	48,267	57,511	5,635	24,325	6,758	12,082	6,917	50,082	$28.88	$1.56	$1.54	$378
2004	14,742	7,559	22,911	12,195	22	53,400	63,071	4,007	24,744	7,137	12,264	6,289	50,434	$39.35	$1.82	$1.87	$580
2005	16,675	8,214	24,372	10,991	28	54,513	63,487	5,739	24,677	7,394	13,717	7,015	52,803	$53.98	$2.20	$2.45	$900
2006	17,926	9,355	23,256	10,633	40	55,119	64,806	6,051	25,312	7,560	17,292	6,699	56,863	$59.70	$2.50	$2.80	$1,070
2007	19,534	10,708	22,012	8,769	41	54,764	66,443	6,258	26,054	7,085	15,946	6,465	55,550	$62.48	$2.73	$2.98	$1,220
2008	22,040	10,259	21,316	6,382	42	53,637	65,178	6,360	25,051	6,509	14,138	6,415	52,113	$86.58	$3.22	$3.79	$1,908
2009	22,941	7,409	23,000	5,520	18	52,475	64,752	6,395	25,324	5,751	12,852	5,854	49,781	$50.22	$2.23	$2.48	$1,152
2010	24,666	6,525	24,000	4,278	27	51,637	62,310	7,832	24,761	5,031	12,707	6,367	48,866	$68.09	$2.82	$3.03	$1,679
2011	26,276	6,997	26,050	3,894	28	55,900	65,369	7,318	25,568	4,825	15,448	6,772	52,613	$82.53	$3.44	$3.87	$2,169
2012	30,204	7,805	25,118	4,394	37	59,153	70,456	8,368	25,228	4,608	14,776	6,694	51,306	$82.73	$3.59	$3.98	$2,499
2013	35,002	7,601	23,124	3,111	29	57,345	67,892	11,493	26,085	4,468	15,317	6,366	52,236	$84.79	$3.45	$3.88	$2,968
2014	40,914	7,662	23,425	3,636	25	60,548	70,931	15,090	26,469	4,816	15,169	6,272	52,726	$79.04	$3.30	$3.85	$3,234
2015	37,136	7,048	22,211	4,963	7	59,549	70,385	11,809	27,776	5,288	14,293	6,167	53,524	$40.69	$2.47	$2.67	$1,511
2016	30,528	7,110	27,318	5,873	3	64,482	75,780	6,348	28,535	5,963	14,248	6,575	55,321	$36.92	$2.19	$2.31	$1,127
2017	34,438	5,763	26,187	4,967	9	67,311	78,473	4,043	28,769	6,357	15,043	6,762	56,931	$44.24	$2.39	$2.71	$1,524
2018	37,117	5,616	23,819	5,803	7	63,780	75,506	8,575	28,725	8,619	15,700	6,671	59,715	$56.85	$2.82	$3.22	$2,110
2019	36,933	5,253	26,059	8,308	6	69,067	80,371	7,487	29,667	7,501	15,040	6,953	59,161	$48.32	$2.74	$3.04	$1,785
2020	31,001	4,820	22,572	7,030	3	59,835	70,800	5,588	27,425	5,251	15,714	6,835	55,225	$34.91	$2.32	$2.52	$1,082
2021	35,774	4,189	25,010	8,582	8	66,737	77,935	6,818	28,963	7,369	15,049	6,878	58,259	$60.60	$3.25	$3.40	$2,168
2022p	45,392	4,003	26,178	8,576	12	71,066	82,837	13,084	29,350	8,049	15,300	6,800	59,499	$80.82	$4.23	$4.97	$3,669
2023e	52,500	4,100	24,700	7,500	13	67,600	80,400	21,200	28,800	8,400	14,200	6,700	58,100	$67.50	$3.90	$4.38	$3,544

p = motor gasoline, distillate, other, and total consumption is preliminary

e = all data are estimated

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

2 Estimated 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)

Table 18.2: Supply, Disposition, Prices, and Value of Natural Gas in Utah, 2000-2023e

	Production				Consumption by End Use							Prices					Value
	Gross Production	Dry Production	Actual Sales	Natural Gas Liquids Production	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
Year	Million cubic feet			Thousand bbl	Million cubic feet							$/thousand cubic feet				$/bbl	Million $
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	295,826	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	272,978	262,157	223,142	4,003	75,938	47,336	322	41,348	67,386	31,972	264,302	$2.51	$7.82	$6.35	$5.00	$24.07	$754
2020	242,560	233,215	202,663	2,935	74,191	44,216	273	40,119	67,226	29,826	255,851	$1.96	$8.15	$6.56	$5.07	$22.64	$524
2021	240,079	230,784	197,867	2,785	71,628	43,970	290	39,747	75,956	30,760	262,351	$4.10	$8.99	$7.37	$5.43	$56.97	$1,105
2022	260,595	249,719	215,799	3,962	78,791	47,600	325	38,179	79,666	29,378	273,939	$7.07	$10.48	$8.92	$7.97	$64.28	$2,020
2023e	280,000	269,000	231,000	5,400	79,400	48,400	275	34,900	85,200	30,500	278,675	$7.40	$13.70	$12.10	$10.00	$39.00	$2,201

e = estimates
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 18.3: Supply, Disposition, Price, and Value of Coal in Utah, 2000-2023e

	Supply		Distribution	Consumption by End Use					Exports		Prices		Value
Year	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 $
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	$43.31	$499
2019	14,347	2,219	15,284	0	0	382	11,891	12,272	2,077	3,964	$37.95	$42.79	$544
2020	13,325	2,334	13,176	0	0	306	10,866	11,173	1,521	1,554	$37.22	$44.53	$496
2021	12,542	1,571	12,953	0	0	335	12,274	12,609	1,656	2,292	$38.41	$43.93	$482
2022	10,719	2,323	11,879	0	0	318	10,571	10,889	1,446	2,803	$47.85	$47.77	$513
2023e	8,000	3,600	6,300	0	0	300	8,350	8,650	1,000	950	$42.00	$53.20	$336

e = estimates
Note: Prices and values are in nominal dollars.
Source: Utah Geological Survey, U.S. Energy Information Administration

Table 18.4: Supply, Disposition, and Price of Electricity in Utah, 2000-2023e

	Net Generation by Fuel Type										Consumption by End Use					Prices by End Use			
Year	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
	Gigawatt hours										Gigawatt hours				MWh/person	¢/kilowatt hour			
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	3.16	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	3.20	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	3.04	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	3.06	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	3.06	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	3.01	10.4	8.3	6.0	8.2
2020	22,806	40	9,460	817	377	803	2,571	78	137	37,087	10,547	11,444	9,672	31,663	3.21	10.4	8.3	5.9	8.3
2021	26,376	38	10,686	494	420	825	3,479	81	167	42,566	10,950	12,255	9,472	32,678	3.28	10.4	8.1	6.2	8.3
2023	22,390	31	11,107	595	463	723	3,853	74	149	39,386	11,344	12,917	9,105	33,366	3.33	10.8	8.4	6.8	8.8
2023e	16,100	30	12,300	520	530	750	3,950	80	100	34,360	11,100	13,250	8,600	32,950	3.20	11.1	8.6	7.0	9.1

e = estimates

MWh = megawatt hours

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

2 Includes 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

Minerals

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

Utah mines produce several different mineral commodities, including the base and precious metals of copper, gold, iron, molybdenum, beryllium, magnesium, and silver. Utah also produces many industrial minerals, including potash, sand and gravel, crushed stone, salt, cement, lime, phosphate, uintaite (Gilsonite®), and gypsum.

CHAPTER SUMMARY

In 2023, Utah mining created an estimated $3.7 billion in mineral production value, including a metals value of $2.0 billion (56%) and an industrial minerals value of $1.6 billion (44%). Projections forecast increased values in 2024.

YEAR IN REVIEW

The Utah Geological Survey (UGS) projects an estimated nominal gross production value of metallic and industrial mineral commodities of $3.7 billion in 2023, a 13% drop from the $4.2 billion 2022 estimated value. The U.S. Geological Survey reported that the 2022 value of Utah's nonfuel (metallic and industrial) minerals production ranked eighth nationally, accounting for 3.7% of the total U.S. nonfuel minerals production. The UGS projects 2023 production values from industry production surveys, corporate quarterly reports, and discussions with mining industry professionals.

The $3.7 billion 2023 mineral production value estimate includes a metals value of $2.0 billion (56%) and an industrial minerals value of $1.6 billion (44%). Utah's metal production includes copper, gold, iron, molybdenum, beryllium, and silver. Utah also produces a long list of industrial mineral commodities including potash, salt, sand and gravel, crushed stone, portland cement, lime, limestone, lithium, phosphate, uintaite (Gilsonite®), gypsum, frac sand, and other mineral products.

The most significant metal producer in the state is Rio Tinto's Bingham Canyon open pit mine, which ranks as the second largest copper producer in the country. Bingham Canyon is the largest producer of copper, gold, and silver in Utah and is the state's only producer of molybdenum and tellurium. In 2023, the Bingham operation experienced a conveyor failure between the concentrator and refinery, and undertook the largest smelter and refinery rebuild in the operation's history. As a result, estimates indicate copper production in 2023 will be lower than previous estimates. However, the mine's short- to medium-term outlook remains robust. In the past three years, Rio Tinto announced a $108 million investment in an underground mining characterization study; a $55 million investment to commence underground mining in the Lower Commercial Skarn, expected to deliver an additional 33,000 tons of copper through 2027; and a $500 million investment to develop the North Rim Skarn, which is expected to supplement an additional 280,000 tons of copper over ten years starting in 2024. Given the development of these higher-grade underground orebodies coupled with the ongoing phases 1 and 2 of the south wall pushback in the open pit, copper and precious metal production from Bingham Canyon is expected to increase moderately in 2024 and notably starting in 2025.

The Lisbon Valley copper mine in San Juan County, the only other copper producer in Utah, recently completed a significant resource expansion program that increased their copper reserves more than fivefold. Production remained relatively steady at 10% of the mine's infrastructure capacity, but the resource expansion as well as continued efforts to pursue in situ leaching mining technology may increase near-term production at Lisbon Valley.

Estimates suggest industrial mineral value from 2022 to 2023 decreased modestly. Three Utah facilities produce potash, and potash prices declined during 2023 after rising significantly in

2022 due to the war in Ukraine. Lithium prices also dropped significantly after peaking in 2022. US Magnesium continues to work towards increasing lithium production at their Great Salt Lake (GSL) facility after beginning production in 2020. U.S. Geological Survey data for the first half of 2023 indicate that construction aggregate production in Utah was substantially lower (over 20%) than the first half of 2022. Construction aggregate, consisting of sand and gravel and crushed stone, is one of the more significant industrial mineral commodities in Utah and can indicate growth or decline of the construction sector.

Utah produced five critical minerals in 2023 (beryllium, lithium, palladium, platinum, and tellurium), and hosts known resources of seven more (aluminum, fluorspar, indium, gallium, germanium, vanadium, and zinc) based on the U.S. Department of the Interior's 2022 critical mineral list. Beryllium is produced from the Spor Mountain mining district by Materion Resources, and this operation accounted for half of global beryllium production and over 85% of domestic beryllium supply. Platinum and palladium, along with tellurium, are recovered as byproducts of metal refining at Bingham Canyon. In 2023, Rio Tinto announced a partnership to evaluate the potential to produce cobalt and bismuth as additional critical mineral byproducts from Bingham Canyon. Normally, US Magnesium produces magnesium metal, also a critical mineral, from GSL brines but they did not produce this year due to mechanical issues at their plant. When operational, they are the only magnesium metal producer in North America. Notable established resources of critical minerals include Blawn Mountain in Beaver County as the largest alunite (aluminum, potash) resource in the country and the West Desert zinc-copper-indium deposit in Juab County as the only indium resource in the country.

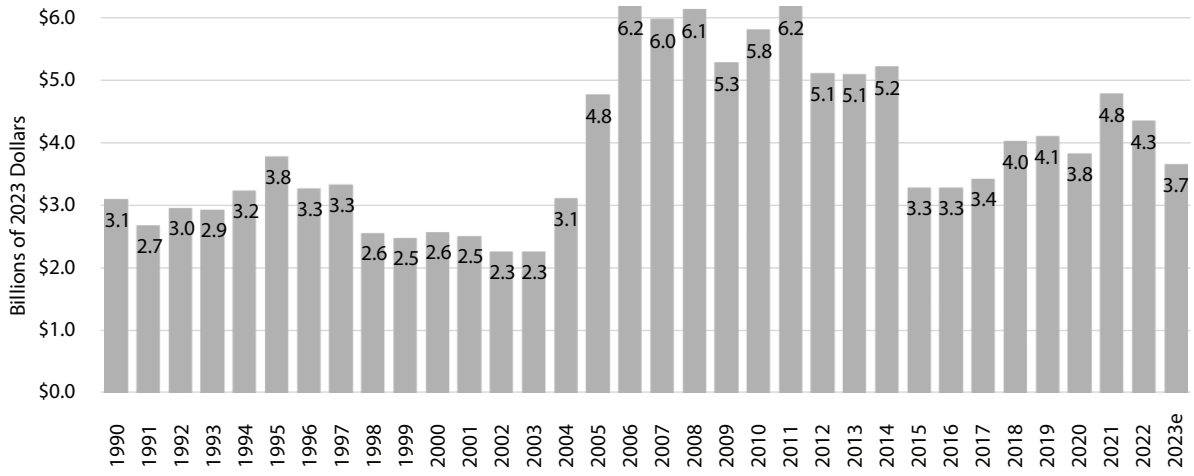
Metal exploration activity in the state decreased modestly in 2023 due to multiple projects completing large exploration and drilling programs in 2022. New and/or updated resource announcements following the 2022 drilling include projects in Juab, Iron, San Juan, Utah, and Millard Counties, primarily for copper and gold. Exploration will likely be subdued in 2024 as mature projects reach feasibility stage assessments. Much of the new early stage exploration in the state has been focused on lithium, though copper and gold remain the most significant commodities with sustained exploration.

Recent industrial mineral exploration and development in Utah included fluorspar, lithium, potash, halloysite, and others. Utah is poised to become the nation's only fluorspar producer as Ares Strategic Mining revives the Lost Sheep mine, Utah's largest historical producer of fluorspar. Although lithium prices dropped substantially in 2023, interest in Utah lithium resources remains as projections call for global demand to rise significantly. Lithium activity has focused on GSL and the Paradox Basin. Compass Minerals (an existing potash operator) and other companies have expressed interest in extracting lithium from GSL. However, as the State crafts rules for lithium extraction at the lake, regulatory uncertainty has led to some short-term withdrawal of development plans. In the Paradox Basin, several companies have land positions for lithium and one company released a resource estimate for their holdings showing an in-place resource of 1.7 million tons of lithium carbonate equivalent. Additional lithium exploration activity has also emerged in rock-hosted deposits in the West Desert. Potash interest revived somewhat in Utah in 2023 due to 2022 price increases on the known resource areas of the Paradox Basin and Sevier Lake/Playa. Other recent exploration for industrial minerals in the North Tintic mining district has led to the discovery of a significant halloysite deposit known as the Halloysite Hills. The deposit is reported to rival the nearby historic Dragon mine deposit in its size and purity.

2024 OUTLOOK

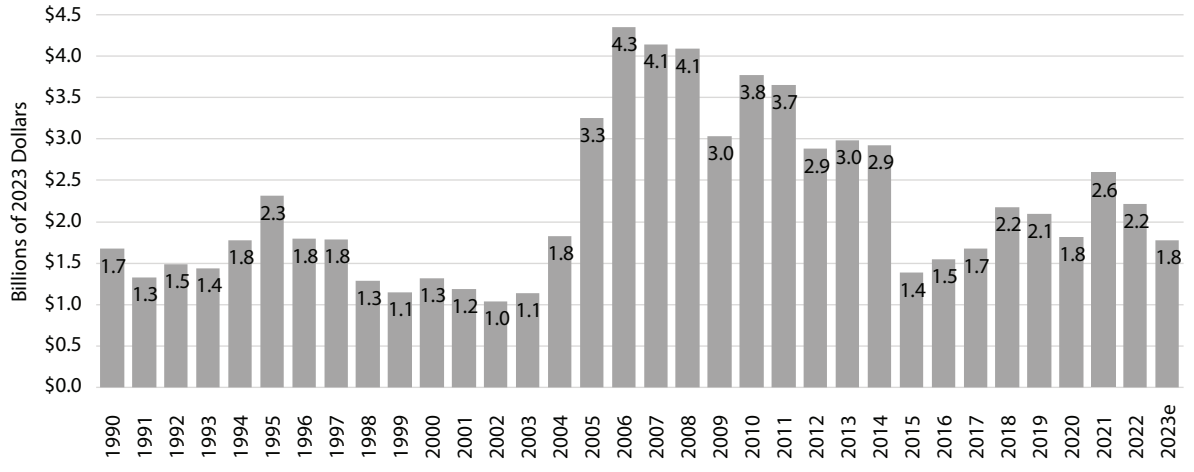
Forecasts expect Bingham Canyon will increase mined copper and precious metals in 2024, due to both lower than expected production in 2023 and the start of multiple growth projects. The medium- to long-term outlook for copper remains robust. Consolidation of exploration projects will likely cause short-term contraction of exploration budgets in 2024; however, the need for more resources to support a high-tech and increasingly carbon-neutral economy will likely drive strong exploration budgets in the medium to long term. Despite price volatility, lithium exploration and development activity in Utah will likely continue based on projected demand. Major swings in production and commodity prices for other industrial minerals are not expected in 2024. In summary, the UGS estimates that the production value of Utah's metallic and industrial mineral commodities will increase from 2023 to 2024, mainly due to higher production at Bingham.

Figure 21.1: Total Value of Utah's Annual Metallic and Industrial Mineral Production, 1990-2023e



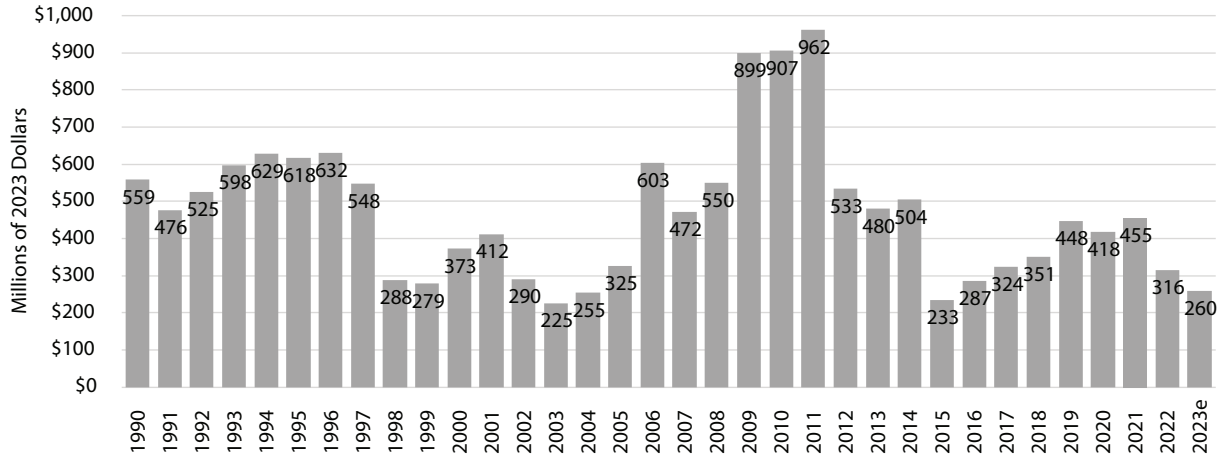
e = estimate
Source: Utah Geological Survey

Figure 21.2: Value of Utah's Annual Base Metal Production, 1990-2023e



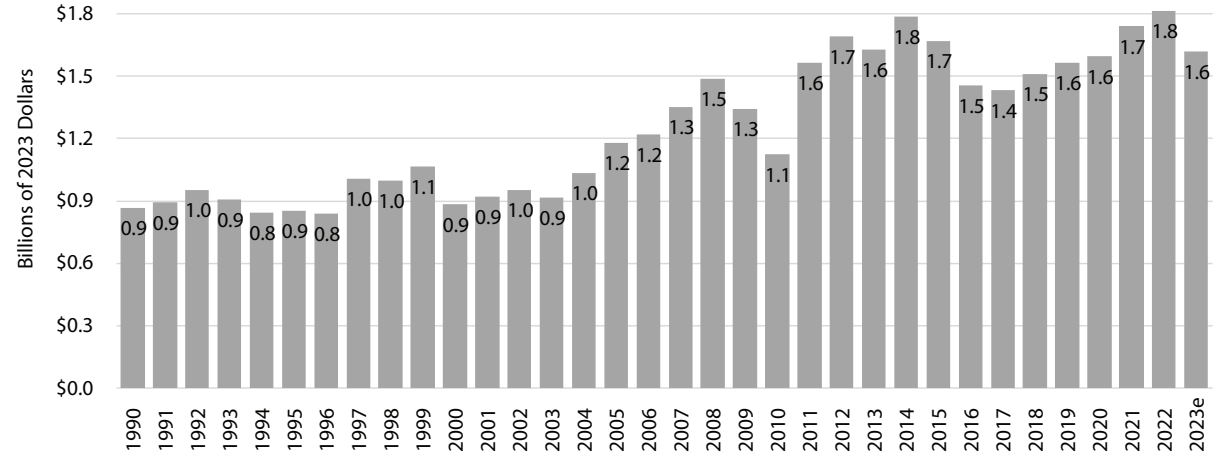
e = estimate
Source: Utah Geological Survey

Figure 21.3: Value of Utah's Annual Precious Metal Production, 1990-2023e



e = estimate
Source: Utah Geological Survey

Figure 21.4: Value of Utah's Annual Industrial Mineral Production, 1990-2023e



e = estimate
Source: Utah Geological Survey