



The Economic Contributions of U.S. Mining, 2019

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EXECUTIVE SUMMARY

Nearly 13,000 operations mine for coal, metal ores and non-metallic minerals in the United States, according to the Mine Safety and Health Administration. These mines provide the energy resources and raw materials that are essential to a growing economy.

National Results

U.S. mining directly and indirectly generated more than 1.3 million full-time and part-time jobs in 2019, including employees and the self-employed.

- U.S. mines accounted for 498,000 jobs.
- Jobs in other industries attributable to or induced by U.S. mining totaled nearly 900,000.

U.S. labor income associated with U.S. mining exceeded \$92 billion in 2019, which includes wages and salaries, other employee benefits and owner-operator business (proprietors') income.

Table E-1. Economic Contribution of U.S. Mining, 2019

Item	Direct	Indirect and Induced	Total
Employment	498,689	880,538	1,379,227
Labor Income (billions of dollars)	\$35.8	\$54.5	\$90.4
Contribution to GDP (billions of dollars)	\$94.9	\$104.1	\$199.0
Taxes Paid (billions of dollars)	\$17.8	\$23.0	\$40.8

Source: Calculations based on Mine Safety & Health Administration 2019 employment and the IMPLAN modeling system

Contribution by Mining Segment

The direct contributions or value added by each of the three mining sectors identified in this report include the operations of the mine, support activities and transportation of output from the mine.

The coal sector of U.S. mining accounted for 387,186 total jobs, \$28.4 billion in total labor income and \$58.1 billion in total contribution to GDP (see Table 1). Annual wages and salaries in coal mining operations (excluding support activities and transportation) averaged approximately \$91,200 in 2019.¹ Overall, the total jobs attributed to coal mining were responsible for approximately 28 percent of U.S. mining's total employment contribution, 31 percent of total labor income and 29 percent of mining's total contribution to GDP.²

The metal ore mining segment of U.S. mining accounted for 278,559 jobs, \$16.9 billion in labor compensation and \$48.6 billion of GDP. Annual wages and salaries in the metal ore mining sector averaged \$95,700. Metal ore mining accounted for 20 percent of total mining employment, 19 percent of labor income and 24 percent of mining's contribution to GDP.

The non-metallic mineral mining segment of U.S. mining accounted for 713,482 jobs, \$45.1 billion in labor compensation and \$92.3 billion of U.S. GDP. Annual wages and salaries in the non-metallic mining sector averaged \$69,300. Non-metallic mineral mining represented 52 percent of mining employment, 50 percent of labor income and 46 percent of its contribution to GDP.³

Table 1. Economic Contribution of U.S. Mining Operations by Segment

Sector	Coal Mining	Metal Ore Mining	Non-metallic Mineral Mining	Total
Employment				
Direct	118,956	98,358	281,375	498,689
Indirect & Induced	268,230	180,201	432,107	880,538
Total	387,186	278,559	713,482	1,379,227
Labor Income (\$billions)				
Direct	\$10.3	\$7.0	\$18.5	\$35.8
Indirect & Induced	\$18.1	\$9.9	\$26.5	\$54.5
Total	\$28.4	\$16.9	\$45.1	\$90.4
Contribution to GDP (\$billions)				
Direct	\$25.2	\$28.6	\$41.1	\$94.9
Indirect & Induced	\$32.9	\$20.0	\$51.2	\$104.1
Total	\$58.1	\$48.6	\$92.3	\$199.0

Tax Payments of U.S. Mining

Economic activity attributable to U.S. mining is taxed at the federal, state and local levels. These taxes take a variety of forms, including income taxes on company profits and employee wages, property taxes on equipment and structures and excise taxes on output. Mining activity generated an estimated nearly \$18 billion in federal, state and local taxes in 2019 that supported direct, indirect and induced taxes of \$41 billion.

1 Average wage and salary data from Bureau of Labor Statistics, Quarterly Census Employment and Wages, 2019. Labor income as presented in Table 1 results reflects total employee compensation (including benefits) and self-employment income for mining, support activities, and transportation attributable to mining output.

2 Data derived from IMPLAN model multipliers. IMPLAN data is based on U.S. Bureau of Economic Analysis data.

3 The transport of mining products, included in the figures above, represents a significant portion of these impacts. Transportation of mining output, for instance, is responsible for 92,000 direct transportation jobs and also contributes to labor income and GDP. These amounts have been distributed to coal, metal ore, and non-metallic mineral mining in Table 1.

Methodology

The economic contributions of U.S. mining to the domestic economy include its direct impact plus the economic activity of other industries that supply the mining industry. To quantify these linkages, we rely on the IMPLAN model, an input-output (I-O) model based on federal government data.

- Direct contributions: effects directly attributable to mining, such as the employment and output of mining companies. These effects include the transportation of mine output from the mine to the purchaser.
- Indirect contributions: effects of upstream suppliers to mining, including contractors and other companies providing inputs to mining companies, e.g. equipment manufacturers. Indirect effects also include the activity of suppliers to these companies.
- Induced contributions: spending by mining and supplier employees. Employees throughout the supply chain receive income associated with the direct and indirect activities, a portion of which is consumed. This consumption causes additional economic activity attributable to U.S. mining.

We have made adjustments to the output of the IMPLAN model to provide a more complete and accurate description of the overall contribution of U.S. mining.

See Appendix A for a more detailed description of the methodology.

This analysis can be considered conservative in that it does not include the economic or employee benefits from coal and uranium-based generation, or the manufacturing and other end-users of metal and non-metal minerals. According to the Edison Electric Institute, U.S. electricity generation directly and indirectly supported employment of 2.7 million people and added \$880 billion to the U.S. economy; coal and uranium are responsible for more than 40 percent of total electricity generation. The U.S. Geological Survey estimates that mineral commodities were transformed into \$3.1 trillion worth of goods and services in 2019, an amount equal to nearly 15 percent of the total U.S. GDP.

MINING AND THE U.S. ECONOMY BY STATE

Table 2. U.S. Mining Employment by State, 2019

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	9,530	1,144	4,095	14,769	17,780	32,549
Alaska	3,597	928	203	4,728	6,433	11,161
Arizona	18,841	1,978	2,386	23,205	54,413	77,618
Arkansas	3,076	1,760	728	5,564	6,828	12,392
California	11,364	6,223	2,803	20,390	51,616	72,006
Colorado	7,383	6,874	1,621	15,878	26,818	42,696
Connecticut	911	347	228	1,486	4,856	6,342
Delaware	143	76	18	237	1,378	1,615
District of Columbia	0	34	0	34	1,915	1,949
Florida	7,304	3,581	3,076	13,961	29,936	43,897
Georgia	8,476	1,049	3,567	13,092	20,147	33,239
Hawaii	421	104	187	712	2,279	2,991
Idaho	3,288	489	1,509	5,286	8,515	13,801
Illinois	7,888	3,319	3,495	14,702	30,514	45,216
Indiana	8,889	1,132	2,441	12,462	19,550	32,012
Iowa	3,512	373	495	4,380	6,502	10,882
Kansas	2,864	3,363	711	6,938	5,476	12,414
Kentucky	13,427	2,598	3,291	19,316	24,640	43,956
Louisiana	3,360	3,078	711	7,149	12,880	20,029
Maine	1,147	43	165	1,355	2,789	4,144
Maryland	4,381	708	1,458	6,547	17,457	24,004
Massachusetts	3,216	402	876	4,494	11,104	15,598
Michigan	5,127	2,429	1,582	9,138	18,422	27,560
Minnesota	8,793	810	1,035	10,638	23,664	34,302
Mississippi	1,616	1,840	379	3,835	6,790	10,625
Missouri	7,835	966	1,621	10,422	18,664	29,086
Montana	5,232	1,250	728	7,210	9,795	17,005
Nebraska	1,498	374	356	2,228	4,468	6,696
Nevada	15,855	2,367	2,322	20,544	29,359	49,903
New Hampshire	802	146	231	1,179	3,660	4,839
New Jersey	1,528	464	515	2,507	14,494	17,001
New Mexico	4,969	2,847	938	8,754	11,622	20,376
New York	4,979	1,302	1,160	7,441	17,553	24,994
North Carolina	6,313	982	1,682	8,977	15,025	24,002
North Dakota	2,131	1,995	495	4,621	4,488	9,109
Ohio	8,455	4,334	2,517	15,306	33,765	49,071
Oklahoma	3,335	4,199	1,160	8,694	12,196	20,890
Oregon	2,701	518	515	3,734	8,292	12,026
Pennsylvania	19,705	3,986	5,271	28,962	56,306	85,268
Rhode Island	304	48	77	429	1,244	1,673
South Carolina	3,052	572	1,144	4,768	10,898	15,666
South Dakota	1,359	277	254	1,890	2,576	4,466
Tennessee	5,879	748	1,320	7,947	15,277	23,224
Texas	20,640	5,395	10,016	36,051	74,037	110,088
Utah	11,116	1,468	1,821	14,405	23,956	38,361
Vermont	1,151	93	686	1,930	1,596	3,526
Virginia	9,410	1,255	4,807	15,472	27,831	43,303
Washington	3,355	1,245	649	5,249	12,358	17,607
West Virginia	22,270	4,877	6,614	33,761	32,965	66,726
Wisconsin	4,936	195	1,740	6,871	9,505	16,376
Wyoming	11,147	1,798	6,096	19,041	15,906	34,947
Total Operations	318,511	88,383	91,795	498,689	880,538	1,379,227

Table 3. U.S. Mining Labor Income by State, 2019 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	957	745	1,702
Alaska	304	287	591
Arizona	2,149	3,186	5,335
Arkansas	215	221	436
California	1,268	4,990	6,258
Colorado	1,543	1,533	3,076
Connecticut	61	309	370
Delaware	9	381	390
District of Columbia	0	214	214
Florida	619	1,081	1,700
Georgia	1,081	1,298	2,379
Hawaii	43	83	126
Idaho	244	420	664
Illinois	1,000	2,112	3,112
Indiana	965	1,601	2,566
Iowa	212	334	546
Kansas	199	236	435
Kentucky	1,022	1,083	2,105
Louisiana	341	602	943
Maine	33	156	189
Maryland	483	1,340	1,823
Massachusetts	159	632	791
Michigan	476	866	1,342
Minnesota	912	1,284	2,196
Mississippi	122	160	282
Missouri	516	870	1,386
Montana	457	490	947
Nebraska	111	210	321
Nevada	2,040	1,494	3,534
New Hampshire	47	175	222
New Jersey	362	679	1,041
New Mexico	572	531	1,103
New York	578	2,025	2,603
North Carolina	467	1,100	1,567
North Dakota	377	245	622
Ohio	1,815	2,536	4,351
Oklahoma	1,027	1,202	2,229
Oregon	250	444	694
Pennsylvania	1,937	2,876	4,813
Rhode Island	19	64	83
South Carolina	335	733	1,068
South Dakota	118	134	252
Tennessee	436	889	1,325
Texas	2,285	5,328	7,613
Utah	1,294	2,244	3,538
Vermont	98	83	181
Virginia	788	1,228	2,016
Washington	333	768	1,101
West Virginia	2,873	1,711	4,584
Wisconsin	469	582	1,051
Wyoming	1,822	725	2,547
Total Operations	35,843	54,520	90,363

Table 4. U.S. Mining Contribution to GDP by State, 2019 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	3,502	2,330	5,832
Alaska	1,306	551	1,857
Arizona	8,782	5,816	14,598
Arkansas	444	602	1,046
California	2,831	9,625	12,456
Colorado	3,557	3,220	6,777
Connecticut	138	546	684
Delaware	15	161	176
District of Columbia	12	398	410
Florida	1,359	3,042	4,401
Georgia	1,382	2,785	4,167
Hawaii	98	225	323
Idaho	668	614	1,282
Illinois	3,401	4,473	6,874
Indiana	2,102	2,583	4,685
Iowa	423	887	1,310
Kansas	448	1,307	1,755
Kentucky	2,588	1,955	4,543
Louisiana	1,692	1,463	3,155
Maine	45	201	246
Maryland	731	1,327	2,058
Massachusetts	543	1,524	2,067
Michigan	2,473	2,096	3,569
Minnesota	2,324	2,512	4,836
Mississippi	219	753	972
Missouri	1,239	1,566	2,805
Montana	1,328	849	2,177
Nebraska	221	411	632
Nevada	8,415	3,025	11,440
New Hampshire	106	337	443
New Jersey	353	1,570	1,923
New Mexico	2,350	941	3,291
New York	1,130	3,434	4,564
North Carolina	707	1,944	2,651
North Dakota	864	665	1,529
Ohio	2,411	3,619	6,030
Oklahoma	1,178	1,545	2,723
Oregon	643	1,006	1,649
Pennsylvania	4,401	4,319	8,720
Rhode Island	45	144	189
South Carolina	676	956	1,632
South Dakota	226	276	502
Tennessee	1,018	1,789	2,807
Texas	6,541	11,111	17,652
Utah	3,640	2,586	6,226
Vermont	330	211	541
Virginia	2,499	2,667	5,166
Washington	1,298	2,078	3,376
West Virginia	6,867	3,019	9,886
Wisconsin	1,455	1,439	2,894
Wyoming	5,912	1,563	7,475
Total Operations	94,936	104,066	199,002

U.S. COAL MINING BY STATE

Table 5. Coal Mining Employment by State, 2019

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	3,784	292	1,632	5,708	8,472	14,180
Alaska	104	63	52	219	528	747
Arizona	454	104	109	667	4,900	5,567
Arkansas	11	9	75	95	1,514	1,609
California	195	63	32	290	10,181	10,471
Colorado	1,608	763	549	2,920	5,065	7,985
Connecticut	5	0	0	5	976	981
Delaware	0	0	0	0	441	441
District of Columbia	0	0	0	0	536	536
Florida	55	18	9	82	5,506	5,588
Georgia	26	0	9	35	2,401	2,436
Hawaii	0	0	0	0	530	530
Idaho	84	6	0	90	1,476	1,566
Illinois	4,023	904	1,156	6,083	16,866	22,949
Indiana	4,152	297	1,123	5,572	9,514	15,086
Iowa	10	2	0	12	47	59
Kansas	18	34	2	54	275	329
Kentucky	9,474	1,324	2,154	12,952	17,774	30,726
Louisiana	334	452	106	892	4,939	5,831
Maine	0	0	0	0	622	622
Maryland	2,456	250	848	3,554	7,777	11,331
Massachusetts	26	2	0	28	1,397	1,425
Michigan	3	7	18	28	884	912
Minnesota	197	0	48	245	645	890
Mississippi	268	157	69	494	3,372	3,866
Missouri	228	13	75	316	2,928	3,244
Montana	1,471	328	366	2,165	3,973	6,138
Nebraska	3	2	4	9	855	864
Nevada	57	0	0	57	2,984	3,041
New Hampshire	1	0	0	1	687	688
New Jersey	42	8	14	64	4,582	4,646
New Mexico	1,075	413	225	1,713	2,272	3,985
New York	7	7	10	24	1,914	1,938
North Carolina	66	5	13	84	2,840	2,924
North Dakota	1,502	525	330	2,357	2,429	4,786
Ohio	1,980	569	545	3,094	10,422	13,516
Oklahoma	77	163	19	259	1,808	2,067
Oregon	1	1	2	4	1,198	1,202
Pennsylvania	9,724	1,158	2,959	13,841	28,518	42,359
Rhode Island	0	0	0	0	212	212
South Carolina	47	6	0	53	3,619	3,672
South Dakota	27	3	5	35	567	602
Tennessee	296	22	53	371	2,424	2,795
Texas	2,795	3,617	813	7,225	22,915	30,140
Utah	2,559	226	698	3,483	7,138	10,621
Vermont	2	0	0	2	34	36
Virginia	4,658	372	1,298	6,328	13,785	20,113
Washington	103	18	19	140	6,136	6,276
West Virginia	20,237	1,775	6,021	28,033	27,884	55,917
Wisconsin	20	3	2	25	419	444
Wyoming	6,601	586	2,061	9,248	9,049	18,297
Total Operations	80,866	14,567	23,523	118,956	268,230	387,186

Table 6. Coal Mining Labor Income by State, 2019 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	544	355	899
Alaska	7	28	35
Arizona	78	217	295
Arkansas	2	22	24
California	9	1,898	1,907
Colorado	234	304	538
Connecticut	1	115	116
Delaware	0	330	330
District of Columbia	0	90	90
Florida	3	5	8
Georgia	3	214	217
Hawaii	0	12	12
Idaho	8	160	168
Illinois	543	1,195	1,738
Indiana	554	1,099	1,653
Iowa	4	29	33
Kansas	1	15	16
Kentucky	725	689	1,414
Louisiana	49	173	222
Maine	0	61	61
Maryland	306	891	1,197
Massachusetts	2	93	95
Michigan	0	67	67
Minnesota	4	122	126
Mississippi	29	19	48
Missouri	43	163	206
Montana	156	285	441
Nebraska	1	39	40
Nevada	2	231	233
New Hampshire	1	39	40
New Jersey	3	264	267
New Mexico	140	122	262
New York	2	167	169
North Carolina	1	174	175
North Dakota	251	130	381
Ohio	571	642	1,213
Oklahoma	47	116	163
Oregon	0	70	70
Pennsylvania	1,080	1,569	2,649
Rhode Island	0	22	22
South Carolina	87	349	436
South Dakota	2	29	31
Tennessee	20	140	160
Texas	336	2,119	2,455
Utah	318	345	663
Vermont	0	2	2
Virginia	471	590	1,061
Washington	13	455	468
West Virginia	2,657	1,447	4,104
Wisconsin	2	24	26
Wyoming	978	385	1,363
Total Operations	10,288	18,121	28,409

Table 7. Coal Mining Contribution to GDP by State, 2019 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,768	1,516	3,284
Alaska	26	96	122
Arizona	125	219	344
Arkansas	4	48	52
California	14	1,897	1,911
Colorado	686	987	1,673
Connecticut	3	288	291
Delaware	1	58	59
District of Columbia	0	146	146
Florida	29	901	930
Georgia	18	594	612
Hawaii	0	87	87
Idaho	8	81	89
Illinois	1,176	2,391	3,567
Indiana	1,195	1,460	2,655
Iowa	6	186	192
Kansas	20	294	314
Kentucky	1,733	1,209	2,942
Louisiana	123	420	543
Maine	0	59	59
Maryland	315	636	951
Massachusetts	11	60	71
Michigan	4	398	402
Minnesota	44	310	354
Mississippi	72	288	360
Missouri	88	354	442
Montana	451	377	828
Nebraska	2	90	92
Nevada	2	173	175
New Hampshire	0	79	79
New Jersey	5	419	424
New Mexico	296	212	508
New York	3	935	938
North Carolina	8	531	539
North Dakota	457	325	782
Ohio	540	1,230	1,770
Oklahoma	43	164	207
Oregon	0	149	149
Pennsylvania	2,352	2,129	4,481
Rhode Island	0	37	37
South Carolina	2	224	226
South Dakota	8	62	70
Tennessee	38	441	479
Texas	1,528	3,958	5,486
Utah	725	834	1,559
Vermont	2	26	28
Virginia	1,199	1,296	2,495
Washington	15	374	389
West Virginia	6,104	2,588	8,692
Wisconsin	16	267	283
Wyoming	3,960	985	4,945
Total Operations	25,225	32,888	58,113

U.S. METAL ORE MINING BY STATE

Table 8. Metal Ore Mining Employment by State, 2019

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	47	414	33	494	876	1,370
Alaska	2,768	443	52	3,263	3,992	7,255
Arizona	14,706	1,026	1,402	17,134	41,141	58,275
Arkansas	455	876	20	1,351	1,320	2,671
California	1,204	3,080	410	4,694	5,213	9,907
Colorado	2,205	3,406	521	6,132	9,445	15,577
Connecticut	0	180	3	183	170	353
Delaware	53	38	4	95	105	200
District of Columbia	0	34	0	34	120	154
Florida	432	1,769	246	2,447	5,524	7,971
Georgia	0	348	44	392	1,868	2,260
Hawaii	0	52	3	55	104	159
Idaho	706	304	63	1,073	1,385	2,458
Illinois	29	1,547	138	1,714	1,978	3,692
Indiana	3	501	41	545	1,346	1,891
Iowa	0	170	12	182	621	803
Kansas	0	1	207	208	1,217	1,425
Kentucky	0	733	55	788	636	1,424
Louisiana	1,174	68	309	1,551	2,749	4,300
Maine	3	25	3	31	49	80
Maryland	0	262	11	273	652	925
Massachusetts	0	184	14	198	445	643
Michigan	1,510	1,237	153	2,900	6,867	9,767
Minnesota	5,517	433	229	6,179	14,945	21,124
Mississippi	0	916	68	984	806	1,790
Missouri	950	535	130	1,615	3,962	5,577
Montana	2,278	595	53	2,926	2,384	5,310
Nebraska	0	186	13	199	169	368
Nevada	13,476	2,073	852	16,401	19,442	35,843
New Hampshire	0	48	3	51	236	287
New Jersey	0	193	19	212	1,167	1,379
New Mexico	1,675	1,183	188	3,046	3,816	6,862
New York	219	643	86	948	2,281	3,229
North Carolina	20	455	45	520	1,402	1,922
North Dakota	0	720	49	769	611	1,380
Ohio	0	1,859	175	2,034	1,875	3,909
Oklahoma	0	54	608	662	2,861	3,523
Oregon	37	234	18	289	30	319
Pennsylvania	214	1,673	180	2,067	7,165	9,232
Rhode Island	0	24	2	26	19	45
South Carolina	708	259	46	1,013	965	1,978
South Dakota	277	143	17	437	411	848
Tennessee	1,259	374	142	1,775	3,830	5,605
Texas	79	1,557	339	1,975	8,798	10,773
Utah	3,370	782	382	4,534	9,546	14,080
Vermont	0	22	2	24	69	93
Virginia	0	512	43	555	780	1,335
Washington	365	738	74	1,177	1,763	2,940
West Virginia	57	1,171	72	1,300	898	2,198
Wisconsin	0	31	4	35	1,550	1,585
Wyoming	4	805	59	868	597	1,465
Total Operations	55,800	34,916	7,642	98,358	180,201	278,559

Table 9. Metal Ore Mining Labor Income by State, 2019 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	5	38	43
Alaska	218	141	359
Arizona	1,598	2,556	4,154
Arkansas	38	23	61
California	190	344	534
Colorado	744	536	1,280
Connecticut	10	32	42
Delaware	4	5	9
District of Columbia	0	27	27
Florida	41	143	184
Georgia	11	25	36
Hawaii	1	14	15
Idaho	62	40	102
Illinois	11	113	124
Indiana	6	23	29
Iowa	1	7	8
Kansas	0	33	33
Kentucky	8	29	37
Louisiana	88	124	212
Maine	0	11	11
Maryland	1	93	94
Massachusetts	14	15	29
Michigan	196	223	419
Minnesota	649	774	1,423
Mississippi	20	31	51
Missouri	97	182	279
Montana	153	66	219
Nebraska	3	18	21
Nevada	1,777	1,020	2,797
New Hampshire	1	38	39
New Jersey	55	37	92
New Mexico	160	181	341
New York	8	325	333
North Carolina	2	122	124
North Dakota	38	31	69
Ohio	16	177	193
Oklahoma	5	88	93
Oregon	1	22	23
Pennsylvania	87	224	311
Rhode Island	1	4	5
South Carolina	64	95	159
South Dakota	32	26	58
Tennessee	96	248	344
Texas	174	645	819
Utah	237	685	922
Vermont	1	2	3
Virginia	21	106	127
Washington	48	69	117
West Virginia	26	44	70
Wisconsin	1	12	13
Wyoming	1	11	12
Total Operations	7,021	9,878	16,899

Table 10. Metal Ore Mining Contribution to GDP by State, 2019 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	33	209	242
Alaska	1,085	312	1,397
Arizona	7,423	4,318	11,741
Arkansas	91	194	285
California	382	1,790	2,172
Colorado	1,939	1,068	3,007
Connecticut	8	72	80
Delaware	4	28	32
District of Columbia	0	54	54
Florida	100	244	344
Georgia	11	198	209
Hawaii	1	23	24
Idaho	275	178	453
Illinois	12	473	485
Indiana	5	251	256
Iowa	1	111	112
Kansas	71	244	315
Kentucky	21	159	180
Louisiana	904	240	1,144
Maine	0	10	10
Maryland	0	132	132
Massachusetts	5	86	91
Michigan	582	608	1,190
Minnesota	1,803	1,222	3,025
Mississippi	27	155	182
Missouri	639	291	930
Montana	628	260	888
Nebraska	2	42	44
Nevada	7,663	2,431	10,094
New Hampshire	1	39	40
New Jersey	20	188	208
New Mexico	1,280	384	1,664
New York	26	300	326
North Carolina	4	194	198
North Dakota	138	109	247
Ohio	0	328	328
Oklahoma	4	322	326
Oregon	22	159	181
Pennsylvania	5	218	223
Rhode Island	0	8	8
South Carolina	145	64	209
South Dakota	54	29	83
Tennessee	481	356	837
Texas	170	327	497
Utah	2,207	967	3,174
Vermont	0	5	5
Virginia	12	53	65
Washington	76	243	319
West Virginia	227	75	302
Wisconsin	1	164	165
Wyoming	2	39	41
Total Operations	28,590	19,974	48,564

U.S. NON-METALLIC MINERALS MINING BY STATE

Table 11. Non-metallic Mineral Mining Employment by State, 2019

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	5,699	438	2,430	8,567	8,432	16,999
Alaska	725	422	99	1,246	1,913	3,159
Arizona	3,681	848	875	5,404	8,372	13,776
Arkansas	2,610	875	633	4,118	3,994	8,112
California	9,965	3,080	2,361	15,406	26,222	51,628
Colorado	3,570	2,705	551	6,826	12,308	19,134
Connecticut	906	167	225	1,298	3,710	5,008
Delaware	90	38	14	142	832	974
District of Columbia	0	0	0	0	1,259	1,259
Florida	6,817	1,794	2,821	11,432	18,906	30,338
Georgia	8,450	701	3,514	12,665	15,878	28,543
Hawaii	421	52	184	657	1,645	2,302
Idaho	2,498	179	1,446	4,123	5,654	9,777
Illinois	3,836	868	2,201	6,905	11,670	18,575
Indiana	4,734	334	1,277	6,345	8,690	15,035
Iowa	3,502	201	483	4,186	5,834	10,020
Kansas	2,846	3,328	502	6,676	3,984	10,660
Kentucky	3,953	541	1,082	5,576	6,230	11,806
Louisiana	1,852	2,558	296	4,706	5,192	9,898
Maine	1,144	18	162	1,324	2,118	3,442
Maryland	1,925	196	599	2,720	9,028	11,748
Massachusetts	3,190	216	862	4,268	9,262	13,530
Michigan	3,614	1,185	1,411	6,210	10,671	16,881
Minnesota	3,079	477	758	4,214	8,074	12,288
Mississippi	1,348	767	242	2,357	2,612	4,969
Missouri	6,657	418	1,416	8,491	11,774	20,265
Montana	1,483	327	309	2,119	3,438	5,557
Nebraska	1,495	186	339	2,020	3,444	5,464
Nevada	2,322	294	1,470	4,086	6,933	11,019
New Hampshire	801	98	228	1,127	2,737	3,864
New Jersey	1,486	263	482	2,231	8,745	10,976
New Mexico	2,219	1,251	525	3,995	5,534	9,529
New York	4,753	652	1,064	6,469	13,358	19,827
North Carolina	6,227	522	1,624	8,373	10,783	19,156
North Dakota	629	750	116	1,495	1,448	2,943
Ohio	6,475	1,906	1,797	10,178	21,468	31,646
Oklahoma	3,258	3,982	533	7,773	7,527	15,300
Oregon	2,663	283	495	3,441	7,064	10,505
Pennsylvania	9,767	1,155	2,132	13,054	20,623	33,677
Rhode Island	304	24	75	403	1,013	1,416
South Carolina	2,297	307	1,098	3,702	6,314	10,016
South Dakota	1,055	131	232	1,418	1,598	3,016
Tennessee	4,324	352	1,125	5,801	9,023	14,824
Texas	17,766	221	8,864	26,851	42,324	69,175
Utah	5,187	460	741	6,388	7,272	13,660
Vermont	1,149	71	684	1,904	1,493	3,397
Virginia	4,752	371	3,466	8,589	13,266	21,855
Washington	2,887	489	556	3,932	4,459	8,391
West Virginia	1,976	1,931	521	4,428	4,183	8,611
Wisconsin	4,916	161	1,734	6,811	7,536	14,347
Wyoming	4,542	407	3,976	8,925	6,260	15,185
Total Operations	181,845	38,900	60,630	281,375	432,107	713,482

Table 12. Non-metallic Mineral Mining Labor Income by State, 2019 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	408	352	760
Alaska	79	118	197
Arizona	473	413	886
Arkansas	175	176	351
California	1,069	2,748	3,817
Colorado	565	693	1,258
Connecticut	50	162	212
Delaware	5	46	51
District of Columbia	0	97	97
Florida	575	933	1,508
Georgia	1,067	1,059	2,126
Hawaii	42	57	99
Idaho	174	220	394
Illinois	446	804	1,250
Indiana	405	479	884
Iowa	207	298	505
Kansas	198	188	386
Kentucky	289	365	654
Louisiana	204	305	509
Maine	33	84	117
Maryland	176	356	532
Massachusetts	143	524	667
Michigan	280	576	856
Minnesota	259	388	647
Mississippi	73	110	183
Missouri	376	525	901
Montana	148	139	287
Nebraska	107	153	260
Nevada	261	243	504
New Hampshire	45	98	143
New Jersey	304	378	682
New Mexico	272	228	500
New York	568	1,533	2,101
North Carolina	464	804	1,268
North Dakota	88	84	172
Ohio	1,228	1,717	2,945
Oklahoma	975	998	1,973
Oregon	249	352	601
Pennsylvania	770	1,083	1,853
Rhode Island	18	38	56
South Carolina	184	289	473
South Dakota	84	79	163
Tennessee	320	501	821
Texas	1,775	2,564	4,339
Utah	739	1,214	1,953
Vermont	97	79	176
Virginia	296	532	828
Washington	272	244	516
West Virginia	190	220	410
Wisconsin	466	546	1,012
Wyoming	843	329	1,172
Total Operations	18,534	26,521	45,055

Table 13. Non-metallic Mineral Mining Contribution to GDP by State, 2019 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,701	605	2,306
Alaska	195	143	338
Arizona	1,234	1,279	2,513
Arkansas	349	360	709
California	2,435	5,938	8,373
Colorado	932	1,165	2,097
Connecticut	127	186	313
Delaware	10	75	85
District of Columbia	12	198	210
Florida	1,230	1,897	3,127
Georgia	1,353	1,993	3,346
Hawaii	97	115	212
Idaho	385	355	740
Illinois	1,213	1,609	2,822
Indiana	902	872	1,774
Iowa	416	590	1,006
Kansas	357	769	1,126
Kentucky	834	587	1,421
Louisiana	665	803	1,468
Maine	45	132	177
Maryland	416	559	975
Massachusetts	527	1,378	1,905
Michigan	887	1,090	1,977
Minnesota	477	980	1,457
Mississippi	120	310	430
Missouri	512	921	1,433
Montana	249	212	461
Nebraska	217	279	496
Nevada	750	421	1,171
New Hampshire	105	219	324
New Jersey	328	963	1,291
New Mexico	774	345	1,119
New York	1,101	2,199	3,300
North Carolina	695	1,219	1,914
North Dakota	269	231	500
Ohio	1,871	2,061	3,932
Oklahoma	1,131	1,059	2,190
Oregon	621	698	1,319
Pennsylvania	2,044	1,972	4,016
Rhode Island	45	99	144
South Carolina	529	668	1,197
South Dakota	164	185	349
Tennessee	499	992	1,491
Texas	4,843	6,826	11,669
Utah	708	785	1,493
Vermont	328	180	508
Virginia	1,288	1,318	2,606
Washington	1,207	1,461	2,668
West Virginia	536	356	892
Wisconsin	1,438	1,008	2,446
Wyoming	1,950	539	2,489
Total Operations	41,121	51,204	92,325

Details Regarding Methodology and Data

To evaluate the overall economic contribution of U.S. mining in 2019, we followed two general steps: first, derive the direct impacts of mining using MSHA 2019 data; and second, apply the IMPLAN model's multipliers to capture a more complete estimate of the overall impact.

Derivation on Direct Impacts

As described in the report, the IMPLAN model produces economic multipliers to calculate the overall economic contribution of U.S. mining in terms of the direct, indirect and induced impacts. For U.S. mining, the codes in the IMPLAN model align with the NAICS codes presented in the report for the definition of the U.S. mining industry (see Appendix A).

The IMPLAN model relies on employment data from the U.S. Bureau of Economic Analysis (BEA). However, the Mine Safety and Health Administration (MSHA) also collects information on mining industry employment. We believe that the MSHA data more accurately reflect the true direct employment situation of the mining industry. We have applied IMPLAN multipliers to the MSHA data to derive indirect and induced impacts and rounded employment data to the nearest 10 employees.

The BEA classifies contractor activity closely related to mining, such as contract blasting and drilling, in the "Support Activities for Mining" sector (NAICS 213113, 213114, and 213115). These codes also include some activity completed by the mine operator on a fee or contract basis. More generalized services that could be offered to a variety of industries are classified in the industry code associated with the activity, such as Construction (NAICS 23).

Data on the contribution to GDP and labor income by state are derived from the IMPLAN model 2018 multipliers applied to 2019 MSHA and BLS data.

Adjustments to IMPLAN Model

Economic multipliers are designed to measure the overall change in production that would result from a marginal increase in a particular industry. For example, an output multiplier converts a \$1 million increase in output of the mining sector into the total change in output throughout the supply chain. Because some suppliers of U.S. mining might rely on mining for inputs, a marginal change in the mining sector could lead to an additional change in mining activity attributable to the goods it provides its suppliers throughout the economy. This impact is appropriate to include when modeling a marginal change, but when evaluating the overall impact of the industry, these indirect, own-industry impacts should be excluded to prevent double-counting. Therefore, we have adjusted the IMPLAN model results to exclude any indirect or induced effects taking place in the mining industry.

I-O models capture the upstream relationships, but certain downstream impacts are not reflected in the economic multipliers. Some of these effects, such as the transportation of mine output to the purchaser, could be attributable to U.S. mining. To capture the economic activity associated with the transportation of mining output, we have relied on sector-specific transportation margins in the IMPLAN model. Based on these margins, we have estimated the direct, indirect, and induced economic activity associated with this activity at a state level.

Because IMPLAN state models capture only the indirect and induced effects within each state, the indirect and induced effects crossing state borders (“cross-state spillover effects”) are not captured by the IMPLAN state models. As such, the state-level indirect and induced impacts calculated by the IMPLAN state models must be adjusted to add up to the overall impact captured by the national model, which includes the cross-state effects. The state level indirect and induced effects reported throughout this study include adjustments for cross-state spillover effects. The results in this report will differ somewhat from previous analyses because the new IMPLAN contributions analysis program was used rather than the impact analysis program and the analysis includes a 2018 data year (2019 dollar year). IMPLAN’s new contributions analysis program provides more detailed mining sector data and allocates support activities and transportation employment differently.

Appendix A. NAICS Definition of U.S. Mining

Mining Division	Detail	NAICS Code	Description
Coal	Bituminous Coal and Lignite Surface Mining Bituminous Coal Underground Mining Anthracite Mining	212111 212112 212113	This segment includes establishments engaged in: (1) mining bituminous coal, anthracite, and lignite by underground mining, auger mining, strip mining, culm bank mining, and other surface mining; (2) developing coal mine sites; and (3) beneficiating (i.e., preparing) coal.
Metal Ore Mining	Iron Ore Mining Gold Ore Mining Silver Ore Mining Lead Ore and Zinc Ore Mining Copper Ore and Nickel Ore Mining Uranium-Radium-Vanadium Ore Mining All Other Metal Ore Mining	212210 212221 212222 212231 212234 212291 212299	This segment includes establishments primarily engaged in developing mine sites or mining metallic minerals, and establishments primarily engaged in ore dressing and beneficiating operations, such as crushing, grinding, washing, etc. Beneficiating may be performed at mills operated in conjunction with the mines served or at mills operated separately.
Non-metallic Mineral Mining and Quarrying	Dimension Stone Mining/Quarrying Crushed/Broken Limestone Mining/Quarrying Crushed/Broken Granite Mining/Quarrying Other Crushed, Broken Stone Mining/Quarry Construction Sand and Gravel Mining Industrial Sand Mining Kaolin and Ball Clay Mining Clay, Ceramic, Refractory Minerals Mining Potash, Soda, and Borate Mineral Mining Phosphate Rock Mining Other Chemical and Fertilizer Mineral Mining All Other Non-metallic Mineral Mining	212311 212312 212313 212319 212321 212321 212324 212325 212392 212392 212393 212399	This segment includes establishments primarily engaged in developing mine sites, or in mining or quarrying non-metallic minerals (except fuels). Also included are certain well and brine operations, and preparation plants primarily engaged in beneficiating non-metallic minerals.
Support Activities for Coal, Metal, and Non-metallic Mining	Support Activities for Coal Mining Support Activities for Metal Mining Support Activities for Non-metallic Minerals Mining	213113 213114 213115	This segment includes establishments primarily engaged in providing support activities for coal, metal, and non-metallic mining (except site preparation and related construction activities) on a contract or fee basis. Exploration for coal is included in this industry. Contract activities can be performed in-house by mining operators.

Source: Census Bureau, North American Industry Classification System (NAICS)

Appendix B. The IMPLAN Model

IMPLAN is a well-known modeling system developed by the Minnesota IMPLAN Group for estimating economic impacts and is similar to the Regional Input-Output Modeling System developed by the U.S. Department of Commerce. The model is primarily based on government data sources. It can address a wide range of impact topics in a given region (county, state) or the country as a whole.

IMPLAN is built around an “input-output” table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry’s suppliers, and so on. Meanwhile, employees and business owners make personal purchases out of the additional income that is generated by this process, further increasing demand that ripples through the economy. Multipliers describe these iterations. The Type I multiplier measures the direct and indirect effects of a change in economic activity. It captures the inter-industry effects only, i.e., industries buying from local industries. The SAM (Social Accounting Matrix) multiplier captures the direct and indirect effects. In addition, it also reflects induced effects (i.e., changes in spending from households as income increases or decreases due to the changes in production).

National Mining Association
101 Constitution Avenue, NW
Suite 500 East
Washington, D.C. 20001
(202) 463-2600 | www.nma.org