The Economic Contributions of U.S. Mining, 2021

November 2022

A report prepared by the
National Mining Association

NMA
National
Mining
Association

TABLE OF CONTENTS

SUMMARY

About 12,600 operations mine for coal, metal ores and non-metallic minerals in the United States, according to the Mine Safety and Health Administration. These mine operations 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 1.2 million full-time and part-time jobs in 2021, including employees and the self-employed.

- U.S. mines accounted for 459,000 jobs.
- Jobs in other industries attributable to or induced by U.S. mining totaled nearly 800,000.

U.S. labor income associated with U.S. mining exceeded $80 billion in 2021, which includes wages and salaries, other employee benefits and owner-operator business (proprietors') income.

Table E-1. Economic Contribution of U.S. Mining, 2021

Item	Direct	Indirect and Induced	Total
Employment	459,130	789,579	1,248,709
Labor Income (billions of dollars)	$32.6	$48.9	$81.6
Contribution to GDP (billions of dollars)	$93.6	$100.9	$194.4
Taxes Paid (billions of dollars)	$18.0	$22.0	$40.0

Source: Calculations based on Mine Safety & Health Administration 2021 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 291,943 total jobs, $22.0 billion in total labor income and $45.8 billion in total contribution to GDP (see Table 1). Annual wages and salaries in coal mining operations (excluding support activities and transportation) averaged approximately $93,700 in 2021.[1] Overall, the total jobs attributed to coal mining were responsible for approximately 23 percent of U.S. mining's total employment contribution, 27 percent of total labor income and 24 percent of mining's total contribution to GDP.[2]

The metal ore mining segment of U.S. mining accounted for 266,212 jobs, $16.1 billion in labor compensation and $52.1 billion of GDP. Annual wages and salaries in the metal ore mining sector averaged $101,100. Metal ore mining accounted for about 21 percent of total mining employment, 20 percent of labor income and 27 percent of mining's contribution to GDP.

The non-metallic mineral mining segment of U.S. mining accounted for 690,554 jobs, $43.5 billion in labor compensation and $96.4 billion of U.S. GDP. Annual wages and salaries in the non-metallic mining sector averaged $74,100. Non-metallic mineral mining represented about 55 percent of mining employment, 53 percent of labor income and 50 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	90,170	96,011	272,950	459,130
Indirect & Induced	201,773	170,201	417,604	789,579
Total	291,943	266,212	690,554	1,248,709
Labor Income ($billions)				
Direct	$ 7.8	$6.8	$18.0	$32.6
Indirect & Induced	$14.2	$9.2	$25.5	$48.9
Total	$22.0	$16.1	$43.5	$81.6
Contribution to GDP ($billions)				
Direct	$20.2	$30.6	$42.7	$93.6
Indirect & Induced	$25.6	$21.5	$53.7	$100.9
Total	$45.8	$52.1	$96.4	$194.4

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 $18 billion in federal, state and local taxes in 2021 that supported direct, indirect and induced taxes of $40 billion.

1 Average wage and salary data from Bureau of Labor Statistics, Quarterly Census Employment and Wages, 2021. 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 supports employment of 2.7 million people and adds $880 billion to the U.S. economy. The Department of Energy estimated that coal-based electric power generation employed 70,831 in 2021. Coal and uranium together were responsible for more than 40 percent of total electricity generation. The U.S. Geological Survey estimated that mineral commodities were transformed into $3.3 trillion worth of goods and services in 2021, 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, 2021

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	8,076	1,154	3,472	12,702	14,782	27,483
Alaska	3,757	859	180	4,796	6,401	11,197
Arizona	17,674	1,842	2,226	21,742	48,404	70,146
Arkansas	3,061	1,650	698	5,409	5,901	11,310
California	10,736	6,467	2,679	19,881	46,700	66,581
Colorado	6,788	6,492	1,487	14,767	24,839	39,607
Connecticut	853	312	212	1,377	4,809	6,186
Delaware	98	51	13	162	1,001	1,163
District of Columbia	-	29	-	29	1,742	1,771
Florida	7,725	3,657	3,249	14,631	30,916	45,547
Georgia	8,363	1,064	3,511	12,938	23,603	36,540
Hawaii	436	108	195	738	2,218	2,956
Idaho	3,865	694	1,617	6,175	9,776	15,951
Illinois	6,302	2,909	2,990	12,201	23,983	36,183
Indiana	7,860	1,056	2,162	11,078	16,899	27,977
Iowa	3,459	359	489	4,307	6,385	10,691
Kansas	2,685	3,161	670	6,516	5,143	11,659
Kentucky	10,269	2,067	2,565	14,901	18,690	33,591
Louisiana	2,604	2,659	515	5,778	8,976	14,754
Maine	1,177	19	167	1,362	2,845	4,207
Maryland	3,682	659	1,220	5,560	15,484	21,044
Massachusetts	1,462	277	407	2,146	4,742	6,887
Michigan	5,591	2,631	1,767	9,990	21,381	31,371
Minnesota	8,129	751	959	9,839	21,869	31,708
Mississippi	1,280	1,631	315	3,226	5,862	9,088
Missouri	7,888	948	1,620	10,456	17,188	27,644
Montana	5,189	1,254	638	7,081	9,099	16,180
Nebraska	1,524	375	363	2,262	5,113	7,376
Nevada	16,120	2,409	2,318	20,848	29,533	50,381
New Hampshire	813	146	232	1,192	3,631	4,823
New Jersey	1,465	451	492	2,409	11,104	13,513
New Mexico	4,182	2,346	832	7,361	9,854	17,215
New York	4,800	1,283	1,117	7,200	16,261	23,461
North Carolina	5,960	771	1,576	8,308	12,339	20,646
North Dakota	1,926	1,923	453	4,302	4,326	8,628
Ohio	7,327	3,849	2,199	13,375	28,691	42,066
Oklahoma	3,251	4,041	1,143	8,435	10,608	19,043
Oregon	2,629	678	535	3,842	8,609	12,451
Pennsylvania	19,062	3,778	4,992	27,832	53,191	81,022
Rhode Island	334	52	84	471	1,342	1,813
South Carolina	3,224	650	1,130	5,004	10,897	15,900
South Dakota	1,348	288	247	1,883	2,266	4,149
Tennessee	5,654	694	1,291	7,640	14,234	21,874
Texas	18,839	3,439	9,026	31,304	59,837	91,141
Utah	10,901	1,486	1,750	14,136	23,664	37,800
Vermont	1,025	90	613	1,728	1,446	3,174
Virginia	7,909	1,132	4,305	13,346	23,420	36,766
Washington	2,811	578	541	3,931	8,468	12,399
West Virginia	18,443	4,918	5,503	28,863	27,942	56,805
Wisconsin	4,655	184	1,644	6,483	8,886	15,369
Wyoming	9,882	1,777	5,527	17,186	14,283	31,469
Total Operations	**293,093**	**82,101**	**83,936**	**459,130**	**789,579**	**1,248,709**

Table 3. U.S. Mining Labor Income by State, 2021 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	750	620	1,370
Alaska	310	270	580
Arizona	2,002	2,879	4,881
Arkansas	212	209	422
California	1,214	4,280	5,494
Colorado	1,453	1,419	2,872
Connecticut	56	319	375
Delaware	6	292	298
District of Columbia	0	236	236
Florida	654	1,137	1,791
Georgia	1,054	1,608	2,662
Hawaii	43	71	115
Idaho	293	467	760
Illinois	789	1,651	2,440
Indiana	798	1,224	2,022
Iowa	208	325	533
Kansas	186	225	412
Kentucky	781	854	1,635
Louisiana	268	446	714
Maine	34	149	183
Maryland	394	1,073	1,466
Massachusetts	80	439	519
Michigan	517	1,074	1,591
Minnesota	843	1,181	2,025
Mississippi	104	136	240
Missouri	500	785	1,285
Montana	439	426	865
Nebraska	115	257	372
Nevada	2,076	1,501	3,577
New Hampshire	47	165	212
New Jersey	344	498	842
New Mexico	491	445	936
New York	556	1,900	2,456
North Carolina	443	965	1,409
North Dakota	342	226	568
Ohio	1,570	2,329	3,899
Oklahoma	993	1,137	2,130
Oregon	241	487	728
Pennsylvania	1,833	2,714	4,546
Rhode Island	21	75	96
South Carolina	348	742	1,090
South Dakota	129	123	252
Tennessee	419	825	1,245
Texas	1,971	4,224	6,195
Utah	1,250	2,211	3,461
Vermont	86	75	162
Virginia	656	1,051	1,707
Washington	269	538	807
West Virginia	2,383	1,449	3,832
Wisconsin	443	543	986
Wyoming	1,628	649	2,277
Total Operations	**32,642**	**48,928**	**81,569**

Table 4. U.S. Mining Contribution to GDP by State, 2021 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	3,078	1,908	4,986
Alaska	1,453	580	2,033
Arizona	9,254	6,088	15,343
Arkansas	499	656	1,155
California	3,178	10,122	13,299
Colorado	3,693	3,257	6,949
Connecticut	110	447	557
Delaware	16	154	169
District of Columbia	13	409	421
Florida	1,491	3,081	4,572
Georgia	1,410	2,714	4,124
Hawaii	102	229	331
Idaho	797	693	1,490
Illinois	2,173	4,038	6,211
Indiana	2,074	2,566	4,640
Iowa	393	814	1,207
Kansas	466	1,297	1,763
Kentucky	2,040	1,584	3,624
Louisiana	1,801	1,476	3,277
Maine	47	204	251
Maryland	685	1,258	1,942
Massachusetts	530	1,489	2,020
Michigan	1,490	2,026	3,517
Minnesota	2,795	3,033	5,828
Mississippi	215	740	955
Missouri	1,368	1,695	3,063
Montana	1,334	835	2,169
Nebraska	231	410	641
Nevada	8,551	3,018	11,569
New Hampshire	104	334	438
New Jersey	369	1,546	1,916
New Mexico	2,423	944	3,366
New York	1,184	3,375	4,559
North Carolina	739	1,911	2,650
North Dakota	871	673	1,545
Ohio	2,180	2,964	5,144
Oklahoma	1,223	1,584	2,807
Oregon	678	1,031	1,709
Pennsylvania	3,964	3,941	7,905
Rhode Island	46	147	193
South Carolina	712	991	1,703
South Dakota	236	284	520
Tennessee	1,096	1,595	2,690
Texas	6,125	10,060	16,185
Utah	3,909	2,734	6,644
Vermont	345	214	560
Virginia	2,166	2,316	4,482
Washington	1,354	2,094	3,448
West Virginia	5,806	2,571	8,378
Wisconsin	1,299	1,291	2,590
Wyoming	5,436	1,445	6,881
Total Operations	**93,553**	**100,865**	**194,418**

U.S. COAL MINING BY STATE

Table 5. Coal Mining Employment by State, 2021

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	2,352	181	1,014	3,548	5,266	8,814
Alaska	106	64	53	223	538	761
Arizona	111	25	27	163	1,198	1,361
Arkansas	5	4	34	43	688	731
California	138	45	23	205	7,205	7,410
Colorado	1,381	655	471	2,508	4,350	6,858
Connecticut	6	-	-	6	1,171	1,177
Delaware	-	-	-	-	335	335
District of Columbia	-	-	-	-	408	408
Florida	54	18	9	81	5,406	5,486
Georgia	62	-	21	83	5,725	5,809
Hawaii	-	-	-	-	403	403
Idaho	90	6	-	96	1,581	1,678
Illinois	2,596	583	746	3,925	10,883	14,809
Indiana	2,479	177	671	3,327	5,680	9,007
Iowa	8	2	-	10	38	47
Kansas	22	42	2	66	336	402
Kentucky	6,358	889	1,446	8,692	11,928	20,620
Louisiana	167	226	53	446	2,470	2,916
Maine	-	-	-	-	591	591
Maryland	1,696	173	586	2,454	5,370	7,825
Massachusetts	1	0	-	1	54	55
Michigan	8	19	48	75	2,357	2,432
Minnesota	171	-	42	213	560	773
Mississippi	242	142	62	446	3,045	3,491
Missouri	96	5	32	133	1,233	1,366
Montana	1,108	247	276	1,631	2,993	4,623
Nebraska	5	3	7	15	1,425	1,440
Nevada	54	-	-	54	2,827	2,881
New Hampshire	-	-	-	-	621	621
New Jersey	14	3	5	21	1,400	1,421
New Mexico	908	349	190	1,447	1,919	3,366
New York	4	4	6	14	1,094	1,107
North Carolina	29	2	6	37	1,248	1,285
North Dakota	1,311	458	288	2,057	2,120	4,177
Ohio	1,242	357	342	1,941	6,537	8,478
Oklahoma	11	23	3	37	258	295
Oregon	15	15	30	60	1,789	1,849
Pennsylvania	8,233	980	2,505	11,719	24,145	35,864
Rhode Island	-	-	-	-	197	197
South Carolina	45	6	-	51	3,465	3,516
South Dakota	12	1	2	16	252	268
Tennessee	228	17	41	286	1,867	2,153
Texas	2,178	2,819	634	5,630	17,856	23,487
Utah	2,303	203	628	3,135	6,424	9,558
Vermont	2	-	-	2	33	35
Virginia	3,336	266	930	4,532	9,873	14,405
Washington	68	12	13	92	4,051	4,143
West Virginia	16,515	1,449	4,914	22,877	22,756	45,633
Wisconsin	10	2	1	13	210	222
Wyoming	5,539	492	1,729	7,760	7,593	15,353
Total Operations	**61,319**	**10,964**	**17,886**	**90,170**	**201,773**	**291,943**

Table 6. Coal Mining Labor Income by State, 2021 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	338	221	559
Alaska	7	29	36
Arizona	19	53	72
Arkansas	1	10	11
California	6	1,343	1,349
Colorado	201	261	462
Connecticut	1	138	139
Delaware	0	251	251
District of Columbia	0	94	94
Florida	3	5	8
Georgia	7	510	517
Hawaii	0	0	0
Idaho	9	171	180
Illinois	350	771	1,122
Indiana	331	656	987
Iowa	3	23	26
Kansas	1	18	20
Kentucky	487	462	949
Louisiana	25	87	111
Maine	0	55	55
Maryland	211	615	827
Massachusetts	0	183	183
Michigan	1	203	204
Minnesota	3	106	109
Mississippi	26	17	43
Missouri	18	69	87
Montana	118	215	332
Nebraska	1	81	82
Nevada	2	219	221
New Hampshire	0	34	34
New Jersey	1	98	99
New Mexico	118	103	221
New York	1	95	97
North Carolina	1	128	129
North Dakota	219	113	333
Ohio	401	535	936
Oklahoma	17	48	65
Oregon	1	113	114
Pennsylvania	914	1,328	2,243
Rhode Island	0	29	29
South Carolina	83	334	417
South Dakota	2	13	14
Tennessee	15	108	123
Texas	262	1,651	1,913
Utah	286	310	597
Vermont	0	3	3
Virginia	337	423	760
Washington	9	300	309
West Virginia	2,168	1,181	3,349
Wisconsin	1	12	13
Wyoming	821	323	1,144
Total Operations	**7,828**	**14,150**	**21,976**

Table 7. Coal Mining Contribution to GDP by State, 2021 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,275	1,093	2,368
Alaska	21	77	98
Arizona	100	175	275
Arkansas	3	37	40
California	11	1,476	1,487
Colorado	628	903	1,531
Connecticut	2	224	226
Delaware	1	45	46
District of Columbia	0	145	145
Florida	23	721	744
Georgia	14	462	476
Hawaii	0	84	84
Idaho	6	63	69
Illinois	941	1,913	2,854
Indiana	1,163	1,421	2,583
Iowa	5	145	149
Kansas	16	229	244
Kentucky	1,144	798	1,942
Louisiana	98	336	434
Maine	0	55	55
Maryland	289	584	874
Massachusetts	9	48	57
Michigan	3	318	322
Minnesota	35	248	283
Mississippi	65	259	324
Missouri	70	283	354
Montana	361	302	662
Nebraska	2	72	74
Nevada	2	138	140
New Hampshire	0	77	77
New Jersey	4	335	339
New Mexico	237	170	406
New York	2	748	750
North Carolina	6	425	431
North Dakota	436	310	746
Ohio	178	406	584
Oklahoma	33	128	161
Oregon	0	140	140
Pennsylvania	1,882	1,703	3,585
Rhode Island	0	38	38
South Carolina	2	222	224
South Dakota	6	59	65
Tennessee	2	27	30
Texas	1,111	2,877	3,988
Utah	630	725	1,355
Vermont	2	21	22
Virginia	959	1,037	1,996
Washington	12	307	320
West Virginia	5,011	2,125	7,136
Wisconsin	13	214	226
Wyoming	3,425	852	4,277
Total Operations	**20,238**	**25,600**	**45,838**

U.S. METAL ORE MINING BY STATE

Table 8. Metal Ore Mining Employment by State, 2021

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	61	537	43	641	1,137	1,778
Alaska	3,152	504	59	3,716	4,546	8,261
Arizona	13,879	968	1,323	16,170	38,827	54,998
Arkansas	391	753	17	1,161	1,134	2,295
California	1,399	3,579	476	5,454	6,057	11,512
Colorado	2,211	3,415	522	6,149	9,471	15,619
Connecticut	0	156	2	158	169	327
Delaware	33	24	2	59	65	125
District of Columbia	0	29	-	29	119	148
Florida	423	1,732	241	2,396	5,409	7,805
Georgia	11	376	42	429	2,300	2,729
Hawaii	0	54	4	58	111	169
Idaho	1,161	500	104	1,765	2,278	4,042
Illinois	28	1,494	133	1,655	1,910	3,565
Indiana	3	499	41	543	1,346	1,889
Iowa	0	159	13	172	598	770
Kansas	0	5	198	203	1,079	1,282
Kentucky	0	643	49	692	598	1,290
Louisiana	705	41	186	931	1,651	2,582
Maine	0	-	-	-	75	75
Maryland	0	284	16	300	799	1,099
Massachusetts	0	178	12	190	446	636
Michigan	1,592	1,304	161	3,057	7,240	10,297
Minnesota	5,090	399	211	5,701	13,788	19,489
Mississippi	0	899	66	965	806	1,771
Missouri	905	510	124	1,539	3,774	5,313
Montana	2,638	689	61	3,388	2,761	6,149
Nebraska	0	183	12	195	189	384
Nevada	13,780	2,120	871	16,771	19,881	36,652
New Hampshire	0	47	1	48	232	280
New Jersey	0	192	17	209	1,165	1,374
New Mexico	1,065	752	120	1,937	2,426	4,363
New York	222	652	87	961	2,312	3,273
North Carolina	12	273	27	312	841	1,153
North Dakota	0	731	52	783	790	1,573
Ohio	0	1,701	168	1,869	1,979	3,848
Oklahoma	0	58	610	668	2,864	3,532
Oregon	62	392	30	484	50	535
Pennsylvania	197	1,540	166	1,903	6,596	8,499
Rhode Island	0	26	2	28	32	60
South Carolina	943	345	61	1,349	1,285	2,635
South Dakota	309	160	19	487	458	946
Tennessee	1,093	325	123	1,541	3,325	4,866
Texas	21	414	90	525	2,339	2,864
Utah	3,625	841	411	4,877	10,268	15,145
Vermont	0	27	4	31	84	115
Virginia	0	509	40	549	781	1,330
Washington	55	111	11	177	266	443
West Virginia	81	1,664	102	1,847	1,276	3,123
Wisconsin	0	30	5	35	1,556	1,591
Wyoming	5	897	-	902	711	1,613
Total Operations	**55,152**	**33,721**	**7,138**	**96,011**	**170,201**	**266,212**

Table 9. Metal Ore Mining Labor Income by State, 2021 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	6	49	56
Alaska	248	161	409
Arizona	1,508	2,412	3,920
Arkansas	33	20	52
California	221	400	620
Colorado	746	537	1,283
Connecticut	8	30	38
Delaware	2	8	10
District of Columbia	0	30	30
Florida	40	140	180
Georgia	0	59	59
Hawaii	0	12	12
Idaho	102	66	168
Illinois	11	109	120
Indiana	7	24	31
Iowa	1	8	9
Kansas	0	31	31
Kentucky	9	30	39
Louisiana	53	74	127
Maine	0	8	8
Maryland	1	90	91
Massachusetts	15	16	31
Michigan	207	235	442
Minnesota	599	714	1,313
Mississippi	22	34	56
Missouri	92	173	266
Montana	177	76	254
Nebraska	5	21	26
Nevada	1,817	1,043	2,860
New Hampshire	1	32	33
New Jersey	46	31	77
New Mexico	102	115	217
New York	8	329	338
North Carolina	1	73	74
North Dakota	37	30	67
Ohio	15	180	195
Oklahoma	6	97	103
Oregon	2	37	39
Pennsylvania	80	206	286
Rhode Island	1	4	5
South Carolina	85	127	212
South Dakota	45	33	78
Tennessee	83	215	299
Texas	46	171	218
Utah	255	737	992
Vermont	0	2	2
Virginia	34	116	150
Washington	7	10	18
West Virginia	37	63	99
Wisconsin	2	15	17
Wyoming	2	12	14
Total Operations	**6,826**	**9,247**	**16,073**

Table 10. Metal Ore Mining Contribution to GDP by State, 2021 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	29	184	213
Alaska	1,228	353	1,581
Arizona	7,861	4,573	12,434
Arkansas	98	209	306
California	411	1,924	2,334
Colorado	2,114	1,164	3,278
Connecticut	9	77	86
Delaware	4	30	34
District of Columbia	0	56	56
Florida	107	262	370
Georgia	12	213	225
Hawaii	1	25	26
Idaho	362	235	597
Illinois	13	508	521
Indiana	5	270	275
Iowa	1	119	120
Kansas	76	262	339
Kentucky	23	171	193
Louisiana	972	258	1,230
Maine	0	11	11
Maryland	0	142	142
Massachusetts	5	92	98
Michigan	649	678	1,327
Minnesota	2,095	1,420	3,515
Mississippi	29	167	196
Missouri	687	313	1,000
Montana	675	279	954
Nebraska	2	45	47
Nevada	7,862	2,494	10,356
New Hampshire	1	42	43
New Jersey	21	202	224
New Mexico	1,376	413	1,788
New York	28	322	350
North Carolina	4	209	213
North Dakota	148	117	265
Ohio	0	353	353
Oklahoma	4	346	350
Oregon	21	153	175
Pennsylvania	5	234	240
Rhode Island	0	9	9
South Carolina	156	69	225
South Dakota	58	31	89
Tennessee	486	360	846
Texas	224	431	656
Utah	2,425	1,063	3,488
Vermont	0	5	5
Virginia	13	57	70
Washington	82	261	343
West Virginia	244	81	325
Wisconsin	1	176	177
Wyoming	2	38	40
Total Operations	**30,632**	**21,508**	**52,139**

U.S. NON-METALLIC MINERALS MINING BY STATE

Table 11. Non-metallic Mineral Mining Employment by State, 2021

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	5,663	435	2,415	8,513	8,379	16,892
Alaska	499	290	68	858	1,317	2,174
Arizona	3,684	849	876	5,408	8,379	13,787
Arkansas	2,665	893	646	4,205	4,078	8,283
California	9,199	2,843	2,180	14,222	33,438	47,659
Colorado	3,196	2,422	493	6,111	11,019	17,129
Connecticut	847	156	210	1,213	3,468	4,682
Delaware	65	27	10	103	601	703
District of Columbia	0	0	-	-	1,215	1,215
Florida	7,248	1,907	2,999	12,155	20,101	32,256
Georgia	8,290	688	3,447	12,425	15,577	28,003
Hawaii	436	54	191	680	1,704	2,384
Idaho	2,614	187	1,513	4,314	5,917	10,231
Illinois	3,678	832	2,110	6,621	11,189	17,810
Indiana	5,378	379	1,451	7,208	9,872	17,080
Iowa	3,451	198	476	4,125	5,749	9,874
Kansas	2,663	3,114	470	6,247	3,728	9,975
Kentucky	3,911	535	1,071	5,517	6,164	11,681
Louisiana	1,732	2,392	277	4,401	4,856	9,257
Maine	1,177	19	167	1,362	2,179	3,541
Maryland	1,986	202	618	2,806	9,314	12,120
Massachusetts	1,461	99	395	1,955	4,242	6,197
Michigan	3,991	1,309	1,558	6,858	11,784	18,642
Minnesota	2,868	351	706	3,925	7,521	11,446
Mississippi	1,038	591	186	1,815	2,011	3,826
Missouri	6,887	432	1,465	8,784	12,181	20,965
Montana	1,443	318	301	2,062	3,345	5,407
Nebraska	1,519	189	344	2,052	3,499	5,552
Nevada	2,286	289	1,447	4,023	6,826	10,848
New Hampshire	813	99	231	1,144	2,778	3,922
New Jersey	1,451	257	471	2,178	8,539	10,717
New Mexico	2,209	1,245	523	3,977	5,509	9,486
New York	4,574	627	1,024	6,225	12,855	19,080
North Carolina	5,919	496	1,544	7,959	10,250	18,209
North Dakota	615	733	113	1,462	1,416	2,877
Ohio	6,085	1,791	1,689	9,565	20,175	29,740
Oklahoma	3,240	3,960	530	7,730	7,485	15,215
Oregon	2,552	271	474	3,298	6,770	10,067
Pennsylvania	10,632	1,257	2,321	14,210	22,449	36,660
Rhode Island	334	26	82	443	1,113	1,556
South Carolina	2,236	299	1,069	3,604	6,146	9,750
South Dakota	1,027	128	226	1,380	1,556	2,936
Tennessee	4,333	353	1,127	5,813	9,042	14,855
Texas	16,640	207	8,302	25,149	39,642	64,791
Utah	4,973	441	710	6,124	6,972	13,096
Vermont	1,023	63	609	1,695	1,329	3,024
Virginia	4,573	357	3,335	8,265	12,766	21,032
Washington	2,688	455	518	3,661	4,152	7,813
West Virginia	1,847	1,805	487	4,139	3,910	8,049
Wisconsin	4,645	152	1,638	6,436	7,121	13,556
Wyoming	4,338	389	3,797	8,524	5,979	14,503
Total Operations	**176,622**	**37,416**	**58,912**	**272,950**	**417,604**	**690,554**

Table 12. Non-metallic Mineral Mining Labor Income by State, 2021 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	405	350	755
Alaska	54	81	136
Arizona	475	413	888
Arkansas	179	180	358
California	987	2,537	3,524
Colorado	506	620	1,126
Connecticut	47	151	198
Delaware	4	33	37
District of Columbia	0	112	112
Florida	611	992	1,603
Georgia	1,047	1,039	2,086
Hawaii	43	59	103
Idaho	182	230	412
Illinois	428	771	1,199
Indiana	460	544	1,004
Iowa	204	294	498
Kansas	185	176	361
Kentucky	286	361	647
Louisiana	191	285	476
Maine	34	86	120
Maryland	182	367	549
Massachusetts	65	240	305
Michigan	309	636	945
Minnesota	241	361	603
Mississippi	56	85	141
Missouri	389	543	932
Montana	144	135	279
Nebraska	109	155	264
Nevada	257	239	496
New Hampshire	46	99	145
New Jersey	297	369	666
New Mexico	271	227	498
New York	547	1,475	2,022
North Carolina	441	764	1,205
North Dakota	86	82	168
Ohio	1,154	1,614	2,768
Oklahoma	970	992	1,962
Oregon	239	337	576
Pennsylvania	838	1,179	2,017
Rhode Island	20	42	62
South Carolina	179	281	460
South Dakota	82	77	159
Tennessee	321	502	823
Texas	1,663	2,401	4,064
Utah	709	1,164	1,872
Vermont	86	70	157
Virginia	285	512	797
Washington	253	227	480
West Virginia	178	206	383
Wisconsin	440	516	956
Wyoming	805	314	1,119
Total Operations	**17,988**	**25,530**	**43,517**

Table 13. Non-metallic Mineral Mining Contribution to GDP by State, 2021 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,774	631	2,405
Alaska	204	150	354
Arizona	1,293	1,340	2,634
Arkansas	398	410	808
California	2,756	6,722	9,478
Colorado	952	1,189	2,141
Connecticut	99	145	244
Delaware	10	79	89
District of Columbia	13	208	220
Florida	1,360	2,098	3,458
Georgia	1,384	2,039	3,423
Hawaii	101	120	221
Idaho	429	395	824
Illinois	1,219	1,617	2,836
Indiana	906	875	1,781
Iowa	388	550	938
Kansas	374	806	1,180
Kentucky	874	615	1,489
Louisiana	731	882	1,613
Maine	47	138	185
Maryland	395	531	926
Massachusetts	516	1,349	1,865
Michigan	838	1,030	1,868
Minnesota	664	1,365	2,030
Mississippi	122	314	436
Missouri	611	1,099	1,710
Montana	298	254	552
Nebraska	227	292	520
Nevada	687	386	1,073
New Hampshire	103	215	318
New Jersey	344	1,009	1,353
New Mexico	810	361	1,172
New York	1,154	2,305	3,458
North Carolina	728	1,278	2,006
North Dakota	287	246	533
Ohio	2,002	2,205	4,207
Oklahoma	1,185	1,110	2,295
Oregon	656	738	1,394
Pennsylvania	2,077	2,004	4,080
Rhode Island	46	100	146
South Carolina	554	700	1,254
South Dakota	172	194	366
Tennessee	607	1,207	1,815
Texas	4,790	6,751	11,541
Utah	854	947	1,801
Vermont	344	189	532
Virginia	1,194	1,222	2,416
Washington	1,260	1,525	2,785
West Virginia	551	366	917
Wisconsin	1,286	901	2,187
Wyoming	2,009	555	2,564
Total Operations	**42,683**	**53,758**	**96,441**

Details Regarding Methodology and Data

To evaluate the overall economic contribution of U.S. mining in 2021, we followed two general steps: first, derive the direct impacts of mining using MSHA 2021 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 2021 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-metalic 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