The Economic Contributions of U.S. Mining (2017 Update)

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National Mining Association

NMA
National Mining Association

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EXECUTIVE SUMMARY

More than 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 1.5 million full-time and part-time jobs in 2017, including employees and the self-employed.

- U.S. mines accounted for 523,000 jobs.
- Jobs in other industries attributable to or induced by U.S. mining totaled more than 1 million.

U.S. labor income associated with U.S. mining exceeded $95 billion in 2017, which includes wages and salaries, other employee benefits and owner-operator business (proprietors') income.

Table E-1. Economic Contribution of U.S. Mining, 2017

Item	Direct	Indirect and Induced	Total
Employment	523,034	1,008,294	1,531,327
Labor Income (billions of dollars)	$36.7	$58.4	$95.1
Contribution to GDP (billions of dollars)	$98.5	$119.0	$217.5
Taxes Paid (billions of dollars)	$17.0	$25.0	$42.0

Source: Calculations based on Mine Safety & Health Administration 2017 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 419,531 total jobs, $29.6 billion in total labor income and $57.6 billion in total contribution to GDP (see Table 1). Annual wages and salaries in coal mining operations (excluding support activities and transportation) averaged approximately $86,300 in 2017.[1] Overall, the total jobs attributed to coal mining were responsible for approximately 27 percent of U.S. mining's total employment contribution, 31 percent of total labor income and 26 percent of mining's total contribution to GDP.[2]

The metal ore mining segment of U.S. mining accounted for 286,524 jobs, $18.4 billion in labor compensation and $50.7 billion of GDP. Annual wages and salaries in the metal ore mining sector averaged $91,200. Metal ore mining accounted for 19 percent of total mining employment, 19 percent of labor income and 23 percent of mining's contribution to GDP.

The non-metallic mineral mining segment of U.S. mining accounted for 825,273 jobs, $47.0 billion in labor compensation and $109.2 billion of U.S. GDP. Annual wages and salaries in the non-metallic mining sector averaged $64,600. Non-metallic mineral mining represented 54 percent of mining employment, 49 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	118,901	81,487	322,646	523,034
Indirect & Induced	300,629	205,037	502,628	1,008,294
Total	419,531	286,524	825,273	1,531,328
Labor Income ($billions)				
Direct	$10.8	$6.9	$19.1	$36.7
Indirect & Induced	$18.9	$11.6	$27.9	$58.4
Total	$29.6	$18.4	$47.0	$95.1
Contribution to GDP ($billions)				
Direct	$22.3	$29.2	$47.0	$98.5
Indirect & Induced	$35.3	$21.5	$62.2	$119.0
Total	$57.6	$50.7	$109.2	$217.5

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 $17 billion in federal, state and local taxes in 2017 that supported direct, indirect and induced taxes of $42 billion.

1 Average wage and salary data from Bureau of Labor Statistics, Quarterly Census Employment and Wages, 2017. 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 197,111 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 our 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 more than 2.7 million people and added $880 billion to the U.S. economy; coal and uranium are responsible for 50 percent of total electricity generation. The U.S. Geological Survey estimates that mineral commodities were transformed into $2.9 trillion worth of goods and services in 2017, an amount equal to 15 percent of the total U.S. GDP.

MINING AND THE U.S. ECONOMY BY STATE

Table 2. U.S. Mining Employment by State, 2017

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	9,012	136	4,250	13,399	19,901	33,300
Alaska	3,428	158	1,027	4,612	5,510	10,122
Arizona	16,319	429	4,093	20,841	41,349	62,189
Arkansas	3,206	18	2,390	5,614	7,411	13,024
California	10,962	136	11,197	22,295	67,335	89,630
Colorado	7,142	386	9,131	16,659	25,543	42,202
Connecticut	967	60	724	1,751	6,358	8,108
Delaware	126	0	64	190	1,695	1,884
District of Columbia	0	0	0	0	2,265	2,265
Florida	7,843	195	10,933	18,971	40,913	59,884
Georgia	8,248	191	3,962	12,401	25,693	38,094
Hawaii	459	0	293	752	2,679	3,431
Idaho	3,210	304	3,663	7,177	9,317	16,494
Illinois	8,441	471	6,115	15,027	39,737	54,764
Indiana	8,346	166	4,394	12,905	23,116	36,021
Iowa	3,788	39	1,337	5,164	7,234	12,398
Kansas	2,515	9	1,624	4,147	5,764	9,911
Kentucky	13,902	1,140	5,515	20,557	27,664	48,221
Louisiana	4,175	158	2,417	6,749	16,284	23,034
Maine	1,183	12	330	1,524	3,290	4,815
Maryland	4,267	541	1,885	6,693	20,017	26,710
Massachusetts	1,539	42	783	2,364	11,795	14,160
Michigan	5,060	154	7,115	12,329	24,162	36,491
Minnesota	8,464	526	9,917	18,907	34,364	53,271
Mississippi	1,660	0	846	2,506	7,572	10,078
Missouri	7,693	247	1,809	9,749	21,193	30,942
Montana	4,896	188	2,624	7,708	11,269	18,977
Nebraska	1,474	21	698	2,193	5,189	7,382
Nevada	15,755	2,052	6,763	24,570	30,486	55,056
New Hampshire	836	50	970	1,855	3,614	5,469
New Jersey	1,509	96	1,300	2,905	17,326	20,232
New Mexico	4,781	184	3,485	8,450	10,109	18,559
New York	5,128	54	7,389	12,571	33,070	45,640
North Carolina	6,174	42	2,109	8,325	19,337	27,663
North Dakota	2,111	166	1,014	3,292	4,671	7,963
Ohio	9,220	843	5,571	15,634	35,755	51,388
Oklahoma	3,481	106	2,501	6,088	10,966	17,053
Oregon	2,530	117	2,742	5,389	11,226	16,615
Pennsylvania	19,524	817	14,783	35,124	73,133	108,256
Rhode Island	302	11	186	499	1,909	2,408
South Carolina	2,927	10	2,725	5,661	16,439	22,100
South Dakota	1,462	40	619	2,121	3,351	5,472
Tennessee	5,780	244	1,697	7,720	16,595	24,316
Texas	19,590	446	11,525	31,561	69,101	100,662
Utah	10,214	913	4,784	15,911	27,606	43,517
Vermont	1,130	38	568	1,736	2,022	3,758
Virginia	9,806	501	6,726	17,033	31,770	48,803
Washington	3,273	109	1,336	4,719	14,587	19,305
West Virginia	21,509	862	5,549	27,919	27,498	55,418
Wisconsin	4,920	197	3,226	8,343	13,649	21,992
Wyoming	11,601	412	10,411	22,424	19,455	41,879
Total Operations	**311,888**	**14,034**	**197,111**	**523,034**	**1,008,294**	**1,531,327**

Table 3. U.S. Mining Labor Income by State, 2017 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	979	924	1,903
Alaska	326	278	604
Arizona	1,626	2,201	3,827
Arkansas	272	350	622
California	1,267	5,475	6,742
Colorado	1,218	1,437	2,656
Connecticut	91	482	573
Delaware	7	116	123
District of Columbia	0	250	250
Florida	750	2,556	3,306
Georgia	871	1,333	2,204
Hawaii	50	129	180
Idaho	380	394	774
Illinois	1,174	2,542	3,716
Indiana	983	1,154	2,136
Iowa	291	353	644
Kansas	181	267	448
Kentucky	1,525	1,258	2,783
Louisiana	515	862	1,377
Maine	42	159	201
Maryland	453	1,340	1,793
Massachusetts	147	945	1,092
Michigan	800	2,272	2,072
Minnesota	1,391	1,931	3,322
Mississippi	143	366	509
Missouri	718	1,129	1,847
Montana	604	461	1,065
Nebraska	142	251	393
Nevada	2,213	1,619	3,831
New Hampshire	93	219	313
New Jersey	214	1,655	1,869
New Mexico	610	466	1,076
New York	685	2,605	3,289
North Carolina	412	1,039	1,451
North Dakota	314	242	556
Ohio	1,131	1,892	3,023
Oklahoma	323	556	879
Oregon	331	581	912
Pennsylvania	2,361	4,254	6,615
Rhode Island	32	120	152
South Carolina	353	797	1,150
South Dakota	126	157	283
Tennessee	481	910	1,390
Texas	1,947	4,156	6,103
Utah	1,128	1,284	2,412
Vermont	82	83	165
Virginia	1,543	1,883	3,426
Washington	262	981	1,243
West Virginia	2,473	1,183	3,657
Wisconsin	518	603	1,121
Wyoming	2,128	853	2,981
Total Operations	**36,705**	**58,352**	**95,057**

Table 4. U.S. Mining Contribution to GDP by State, 2017 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	2,324	1,962	4,287
Alaska	1,301	607	1,908
Arizona	11,087	4,318	15,405
Arkansas	367	662	1,029
California	3,643	10,400	14,043
Colorado	3,779	3,350	7,129
Connecticut	115	933	1,048
Delaware	23	228	250
District of Columbia	12	432	444
Florida	1,573	3,770	5,343
Georgia	1,254	3,284	4,537
Hawaii	52	300	352
Idaho	1,280	769	2,049
Illinois	3,089	5,290	8,380
Indiana	2,470	2,758	5,227
Iowa	401	1,062	1,462
Kansas	758	1,088	1,846
Kentucky	2,869	2,231	5,099
Louisiana	1,126	1,618	2,744
Maine	46	279	326
Maryland	639	1,466	2,105
Massachusetts	295	1,925	2,220
Michigan	2,416	2,989	5,405
Minnesota	3,136	4,388	7,524
Mississippi	196	686	882
Missouri	729	2,072	2,801
Montana	1,553	937	2,491
Nebraska	202	569	771
Nevada	9,773	3,453	13,226
New Hampshire	127	408	535
New Jersey	248	2,091	2,340
New Mexico	1,460	954	2,415
New York	1,499	5,588	7,087
North Carolina	724	2,821	3,545
North Dakota	745	561	1,306
Ohio	2,657	3,867	6,524
Oklahoma	1,027	1,265	2,292
Oregon	696	1,635	2,332
Pennsylvania	4,590	6,324	10,913
Rhode Island	48	226	274
South Carolina	738	1,034	1,773
South Dakota	244	312	556
Tennessee	535	1,845	2,380
Texas	6,297	11,781	18,078
Utah	2,744	2,155	4,899
Vermont	124	211	335
Virginia	3,036	3,393	6,429
Washington	1,797	2,558	4,355
West Virginia	5,045	2,302	7,347
Wisconsin	1,862	1,960	3,822
Wyoming	5,748	1,876	7,624
Total Operations	**98,501**	**118,992**	**217,493**

U.S. COAL MINING BY STATE

Table 5. Coal Mining Employment by State, 2017

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	3,471	52	1,764	5,287	8,846	14,133
Alaska	104	7	35	146	603	749
Arizona	695	19	219	933	6,341	7,274
Arkansas	78	0	50	128	1,744	1,872
California	58	0	7	65	11,600	11,665
Colorado	1,637	88	816	2,541	6,318	8,859
Connecticut	5	0	0	5	1,500	1,505
Delaware	14	0	0	14	550	564
District of Columbia	0	0	0	0	650	650
Florida	253	9	0	262	6,325	6,587
Georgia	73	0	0	73	3,604	3,677
Hawaii	0	0	0	0	650	650
Idaho	61	0	0	61	1,610	1,671
Illinois	4,237	240	2,126	6,603	18,643	25,245
Indiana	3,951	75	1,573	5,599	10,834	16,433
Iowa	1	0	0	1	59	60
Kansas	10	0	5	15	353	368
Kentucky	10,158	860	2,850	13,867	18,238	32,106
Louisiana	563	23	356	942	5,722	6,664
Maine	0	0	0	0	799	799
Maryland	2,249	281	141	2,671	9,456	12,127
Massachusetts	4	0	0	4	2,444	2,448
Michigan	4	0	4	8	1,021	1,029
Minnesota	76	5	0	81	864	945
Mississippi	416	0	347	763	3,924	4,687
Missouri	238	10	127	375	3,383	3,757
Montana	1,335	56	649	2,040	3,986	6,008
Nebraska	0	0	0	0	998	998
Nevada	27	0	0	27	3,024	3,051
New Hampshire	6	0	0	6	774	780
New Jersey	59	0	0	59	5,900	5,959
New Mexico	1,048	39	501	1588	2,887	4,475
New York	7	0	0	7	2,872	2,879
North Carolina	39	0	12	51	3,058	3,108
North Dakota	1,448	111	587	2,147	3,180	5,326
Ohio	2,792	249	903	3,944	11,215	15,159
Oklahoma	230	7	122	359	2,611	2,970
Oregon	40	0	0	40	1,667	1,708
Pennsylvania	9,312	392	5,659	15,363	31,916	47,279
Rhode Island	0	0	0	0	398	398
South Carolina	55	0	0	55	4,048	4,103
South Dakota	24	0	0	24	688	712
Tennessee	401	18	43	462	2,449	2,911
Texas	3,457	83	1,936	5,475	25,826	31,301
Utah	2,737	245	1,161	4,143	9,608	13,751
Vermont	2	0	0	2	64	66
Virginia	4,853	250	2,321	7,424	15,178	22,602
Washington	102	0	38	140	7,306	7,446
West Virginia	19,635	783	4,184	24,602	23,879	48,481
Wisconsin	16	1	0	17	530	547
Wyoming	7,071	254	3,158	10,483	10,506	20,990
Total Operations	**83,052**	**4,157**	**31,692**	**118,901**	**300,629**	**419,531**

Table 6. Coal Mining Labor Income by State, 2017 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	464	407	872
Alaska	10	43	53
Arizona	131	364	495
Arkansas	9	90	98
California	4	1,698	1,703
Colorado	219	374	593
Connecticut	1	116	117
Delaware	0	42	42
District of Columbia	0	100	100
Florida	13	724	737
Georgia	7	225	232
Hawaii	0	0	0
Idaho	6	75	81
Illinois	597	1,217	1,814
Indiana	519	532	1,051
Iowa	0	4	4
Kansas	1	20	21
Kentucky	1,108	822	1,930
Louisiana	88	320	409
Maine	0	40	40
Maryland	190	643	834
Massachusetts	0	371	371
Michigan	1	65	66
Minnesota	8	54	63
Mississippi	54	190	244
Missouri	60	189	249
Montana	158	165	323
Nebraska	0	50	50
Nevada	3	226	228
New Hampshire	0	48	48
New Jersey	6	813	819
New Mexico	153	137	290
New York	1	233	233
North Carolina	3	185	188
North Dakota	217	164	380
Ohio	338	603	942
Oklahoma	30	148	178
Oregon	0	100	100
Pennsylvania	1,249	1,825	3,073
Rhode Island	0	31	31
South Carolina	3	218	222
South Dakota	2	34	37
Tennessee	27	142	170
Texas	520	1,630	2,150
Utah	340	453	793
Vermont	0	3	3
Virginia	841	891	1,732
Washington	11	527	539
West Virginia	2,276	1,017	3,293
Wisconsin	2	30	32
Wyoming	1,088	471	1,559
Total Operations	**10,759**	**18,870**	**29,630**

Table 7. Coal Mining Contribution to GDP by State, 2017 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	878	753	1,631
Alaska	20	77	97
Arizona	232	407	639
Arkansas	11	131	142
California	6	2,097	2,103
Colorado	688	856	1,544
Connecticut	2	299	301
Delaware	1	65	66
District of Columbia	0	150	150
Florida	26	879	905
Georgia	20	647	667
Hawaii	0	100	100
Idaho	10	84	94
Illinois	1,261	2,408	3,670
Indiana	1,262	1,387	2,649
Iowa	7	228	235
Kansas	30	332	361
Kentucky	1,787	1,309	3,096
Louisiana	120	433	553
Maine	0	70	70
Maryland	201	604	805
Massachusetts	1	570	571
Michigan	5	475	480
Minnesota	60	388	448
Mississippi	68	305	373
Missouri	86	379	465
Montana	395	312	707
Nebraska	0	133	133
Nevada	2	180	182
New Hampshire	0	90	90
New Jersey	1	584	585
New Mexico	333	238	571
New York	4	1,389	1,394
North Carolina	6	567	573
North Dakota	525	345	870
Ohio	800	1,344	2,144
Oklahoma	61	238	298
Oregon	0	310	310
Pennsylvania	2,173	2,949	5,122
Rhode Island	0	70	70
South Carolina	3	250	253
South Dakota	6	58	64
Tennessee	59	440	499
Texas	1,497	4,605	6,102
Utah	546	639	1,186
Vermont	2	34	36
Virginia	1,310	1,403	2,714
Washington	12	448	461
West Virginia	4,545	1,966	6,511
Wisconsin	19	330	349
Wyoming	3,238	954	4,192
Total Operations	**22,320**	**35,311**	**57,632**

U.S. METAL ORE MINING BY STATE

Table 8. Metal Ore Mining Employment by State, 2017

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	58	0	49	107	1,276	1,383
Alaska	2,657	122	789	3,568	2,751	6,319
Arizona	12,136	321	1,742	14,199	26,014	40,213
Arkansas	411	0	6	417	816	1,233
California	1,048	16	589	1,653	11,045	12,699
Colorado	2,136	115	2,517	4,768	7,095	11,863
Connecticut	0	0	0	0	950	950
Delaware	36	0	0	36	245	281
District of Columbia	0	0	0	0	400	400
Florida	356	0	1,068	1,424	12,876	14,300
Georgia	0	0	0	0	2,300	2,300
Hawaii	0	0	0	0	350	350
Idaho	477	46	147	669	805	1,474
Illinois	31	0	0	31	3,650	3,681
Indiana	4	0	0	4	1,600	1,604
Iowa	16	0	0	16	912	928
Kansas	0	0	0	0	900	900
Kentucky	0	0	0	0	1,000	1,000
Louisiana	1,409	54	80	1,543	3,650	5,193
Maine	0	0	0	0	320	320
Maryland	0	0	0	0	1,500	1,500
Massachusetts	0	0	0	0	2,000	2,000
Michigan	1,477	46	4,444	5,967	10,756	16,723
Minnesota	5,124	317	8,577	14,018	24,397	38,415
Mississippi	0	0	0	0	650	650
Missouri	1,151	36	84	1,270	5,444	6,714
Montana	2,046	79	577	2,702	3,721	6,423
Nebraska	0	0	0	0	575	575
Nevada	13,407	1,747	3,572	18,726	20,638	39,364
New Hampshire	0	0	0	0	350	350
New Jersey	0	0	0	0	2,300	2,300
New Mexico	1,533	58	237	1,828	2,303	4,131
New York	117	0	11	128	6,903	7,031
North Carolina	17	0	51	68	2,610	2,678
North Dakota	0	0	0	0	270	270
Ohio	0	0	0	0	2,890	2,890
Oklahoma	0	0	0	0	1,000	1,000
Oregon	31	2	4	37	281	317
Pennsylvania	33	0	462	495	13,959	14,454
Rhode Island	0	0	0	0	245	245
South Carolina	505	0	899	1,404	5,555	6,959
South Dakota	283	13	41	337	741	1,078
Tennessee	1,285	52	125	1,462	4,187	5,649
Texas	117	3	10	130	655	785
Utah	3,005	269	347	3,621	6,747	10,369
Vermont	0	0	0	0	195	195
Virginia	84	4	42	130	1,195	1,325
Washington	574	18	96	687	2,046	2,733
West Virginia	3	0	40	43	85	128
Wisconsin	0	0	0	0	1,690	1,690
Wyoming	0	0	0	0	195	195
Total Operations	**51,567**	**3,317**	**26,604**	**81,487**	**205,037**	**286,524**

Table 9. Metal Ore Mining Labor Income by State, 2017 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	6	70	76
Alaska	265	161	425
Arizona	1,134	1,376	2,510
Arkansas	31	41	72
California	110	812	922
Colorado	445	392	837
Connecticut	0	75	75
Delaware	2	16	19
District of Columbia	0	40	40
Florida	74	716	789
Georgia	0	89	89
Hawaii	0	34	34
Idaho	49	34	83
Illinois	5	235	240
Indiana	0	105	105
Iowa	1	52	53
Kansas	0	25	25
Kentucky	0	26	26
Louisiana	181	193	374
Maine	0	16	16
Maryland	0	122	122
Massachusetts	0	35	35
Michigan	419	557	976
Minnesota	1,041	1,364	2,405
Mississippi	0	42	42
Missouri	165	304	469
Montana	255	151	406
Nebraska	0	30	30
Nevada	1,839	1,048	2,887
New Hampshire	0	36	36
New Jersey	0	200	200
New Mexico	137	111	248
New York	23	585	607
North Carolina	4	153	157
North Dakota	0	18	18
Ohio	0	180	180
Oklahoma	0	45	45
Oregon	3	16	19
Pennsylvania	31	910	941
Rhode Island	0	15	15
South Carolina	123	271	394
South Dakota	28	37	65
Tennessee	86	240	326
Texas	10	43	54
Utah	307	321	628
Vermont	0	2	2
Virginia	20	82	102
Washington	58	136	194
West Virginia	3	4	7
Wisconsin	0	15	15
Wyoming	0	11	11
Total Operations	**6,853**	**11,593**	**18,445**

Table 10. Metal Ore Mining Contribution to GDP by State, 2017 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	43	318	361
Alaska	1,131	352	1,484
Arizona	9,046	2,651	11,697
Arkansas	62	124	186
California	324	1,607	1,931
Colorado	1,480	810	2,290
Connecticut	0	169	169
Delaware	10	44	53
District of Columbia	0	76	76
Florida	75	601	676
Georgia	0	312	312
Hawaii	0	53	53
Idaho	424	126	550
Illinois	15	490	506
Indiana	0	207	207
Iowa	2	111	113
Kansas	0	96	96
Kentucky	0	127	127
Louisiana	427	276	703
Maine	0	36	36
Maryland	0	214	214
Massachusetts	1	281	282
Michigan	1,499	1,063	2,562
Minnesota	2,573	2,853	5,426
Mississippi	0	72	72
Missouri	76	384	460
Montana	759	315	1,074
Nebraska	0	68	68
Nevada	8,667	2,463	11,130
New Hampshire	0	47	47
New Jersey	0	347	347
New Mexico	519	260	779
New York	31	552	583
North Carolina	6	338	343
North Dakota	0	34	34
Ohio	0	355	355
Oklahoma	0	121	121
Oregon	23	168	191
Pennsylvania	11	434	446
Rhode Island	0	35	35
South Carolina	90	156	245
South Dakota	35	45	80
Tennessee	20	361	381
Texas	98	309	408
Utah	1,251	610	1,862
Vermont	0	11	11
Virginia	104	346	450
Washington	317	383	699
West Virginia	45	68	113
Wisconsin	0	187	187
Wyoming	0	22	22
Total Operations	**29,166**	**21,486**	**50,652**

U.S. NON-METALLIC MINERALS MINING BY STATE

Table 11. Non-metallic Mineral Mining Employment by State, 2017

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	5,483	84	2,437	8,005	9,779	17,783
Alaska	667	29	203	899	2,155	3,054
Arizona	3,488	89	2,132	5,709	8,994	14,703
Arkansas	2,717	18	2,334	5,069	4,850	9,919
California	9,856	119	10,601	20,576	44,690	65,266
Colorado	3,369	183	5,798	9,350	12,130	21,480
Connecticut	962	60	724	1,746	3,908	5,653
Delaware	76	0	64	140	900	1,039
District of Columbia	0	0	0	0	1,215	1,215
Florida	7,234	186	9,865	17,285	21,712	38,997
Georgia	8,175	191	3,962	12,328	19,789	32,116
Hawaii	459	0	293	752	1,679	2,431
Idaho	2,672	258	3,516	6,446	6,902	13,348
Illinois	4,173	231	3,990	8,394	17,444	25,837
Indiana	4,391	90	2,821	7,302	10,682	17,984
Iowa	3,771	39	1,337	5,147	6,263	11,410
Kansas	2,505	9	1,619	4,132	4,511	8,644
Kentucky	3,744	281	2,665	6,690	8,426	15,116
Louisiana	2,203	81	1,980	4,264	6,912	11,176
Maine	1,183	12	330	1,524	2,171	3,696
Maryland	2,018	260	1,744	4,022	9,061	13,083
Massachusetts	1,535	42	783	2,360	7,351	9,712
Michigan	3,579	108	2,667	6,354	12,385	18,739
Minnesota	3,264	204	1,341	4,809	9,103	13,912
Mississippi	1,244	0	499	1,743	2,998	4,741
Missouri	6,304	201	1,599	8,104	12,367	20,470
Montana	1,515	54	1,398	2,966	3,580	6,547
Nebraska	1,474	21	698	2,193	3,616	5,809
Nevada	2,321	305	3,191	5,816	6,825	12,641
New Hampshire	830	50	970	1,849	2,490	4,339
New Jersey	1,450	96	1,300	2,846	9,126	11,973
New Mexico	2,200	88	2,746	5,034	4,919	9,954
New York	5,004	54	7,374	12,436	23,295	35,731
North Carolina	6,118	42	2,047	8,207	13,670	21,877
North Dakota	663	55	427	1,145	1,222	2,367
Ohio	6,428	594	4,668	11,690	21,650	33,340
Oklahoma	3,251	99	2,379	5,729	7,354	13,083
Oregon	2,459	116	2,738	5,312	9,279	14,591
Pennsylvania	10,179	425	8,661	19,265	27,258	46,524
Rhode Island	302	11	186	499	1,266	1,765
South Carolina	2,367	10	1,826	4,203	6,836	11,039
South Dakota	1,155	27	578	1,760	1,922	3,682
Tennessee	4,094	174	1,529	5,797	9,959	15,756
Texas	16,016	361	9,579	25,956	42,620	68,576
Utah	4,472	398	3,276	8,146	11,250	19,397
Vermont	1,128	38	568	1,734	1,763	3,497
Virginia	4,869	248	4,362	9,479	15,397	24,876
Washington	2,597	91	1,203	3,891	5,235	9,126
West Virginia	1,871	78	1,325	3,274	3,535	6,809
Wisconsin	4,904	196	3,226	8,326	11,429	19,755
Wyoming	4,530	157	7,253	11,940	8,754	20,694
Total Operations	**177,269**	**6,561**	**138,815**	**322,646**	**502,628**	**825,273**

Table 12. Non-metallic Mineral Mining Labor Income by State, 2017 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	509	446	955
Alaska	51	74	126
Arizona	361	461	822
Arkansas	233	220	452
California	1,153	2,964	4,117
Colorado	554	671	1,226
Connecticut	90	291	382
Delaware	4	58	62
District of Columbia	0	110	110
Florida	664	1,116	1,779
Georgia	864	1,019	1,883
Hawaii	50	95	146
Idaho	325	285	609
Illinois	572	1,090	1,662
Indiana	464	516	980
Iowa	290	297	587
Kansas	180	222	402
Kentucky	417	410	827
Louisiana	246	349	594
Maine	42	103	145
Maryland	262	575	837
Massachusetts	147	539	686
Michigan	381	649	1,030
Minnesota	342	512	855
Mississippi	89	134	223
Missouri	493	636	1,129
Montana	191	145	336
Nebraska	142	171	313
Nevada	370	345	716
New Hampshire	93	135	229
New Jersey	209	642	851
New Mexico	320	218	538
New York	662	1,787	2,449
North Carolina	405	702	1,106
North Dakota	97	61	158
Ohio	793	1,108	1,901
Oklahoma	293	363	656
Oregon	328	464	793
Pennsylvania	1,081	1,520	2,601
Rhode Island	32	74	106
South Carolina	227	307	534
South Dakota	96	86	182
Tennessee	368	528	895
Texas	1,417	2,482	3,899
Utah	482	510	991
Vermont	82	79	161
Virginia	682	910	1,592
Washington	192	318	510
West Virginia	194	163	357
Wisconsin	517	558	1,075
Wyoming	1,039	371	1,411
Total Operations	**19,093**	**27,890**	**46,983**

Table 13. Non-metallic Mineral Mining Contribution to GDP by State, 2017 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,404	892	2,295
Alaska	150	177	327
Arizona	1,809	1,260	3,069
Arkansas	294	406	700
California	3,312	6,696	10,008
Colorado	1,611	1,684	3,295
Connecticut	113	466	578
Delaware	12	119	131
District of Columbia	12	206	218
Florida	1,472	2,290	3,762
Georgia	1,234	2,324	3,558
Hawaii	52	147	199
Idaho	846	559	1,405
Illinois	1,813	2,392	4,204
Indiana	1,208	1,164	2,372
Iowa	392	723	1,115
Kansas	728	660	1,389
Kentucky	1,081	795	1,877
Louisiana	579	909	1,487
Maine	46	173	220
Maryland	438	648	1,086
Massachusetts	293	1,074	1,367
Michigan	912	1,451	2,363
Minnesota	503	1,147	1,650
Mississippi	128	309	436
Missouri	567	1,309	1,876
Montana	399	311	710
Nebraska	202	368	570
Nevada	1,104	810	1,914
New Hampshire	127	271	398
New Jersey	247	1,161	1,408
New Mexico	608	456	1,064
New York	1,463	3,647	5,110
North Carolina	712	1,916	2,629
North Dakota	220	182	402
Ohio	1,857	2,168	4,025
Oklahoma	966	907	1,873
Oregon	674	1,158	1,831
Pennsylvania	2,405	2,941	5,346
Rhode Island	48	121	169
South Carolina	646	629	1,275
South Dakota	202	210	412
Tennessee	455	1,045	1,500
Texas	4,702	6,866	11,568
Utah	946	906	1,852
Vermont	122	166	288
Virginia	1,622	1,643	3,265
Washington	1,468	1,727	3,195
West Virginia	455	268	724
Wisconsin	1,843	1,443	3,286
Wyoming	2,510	900	3,410
Total Operations	**47,014**	**62,195**	**109,209**

Details Regarding Methodology and Data

To evaluate the overall economic contribution of U.S. mining in 2017, we followed two general steps: first, derive the direct impacts of mining using MSHA 2017 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 D).

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). The IMPLAN model does not break the Support Activities for Mining sector into the coal, metal and non-metallic minerals segments. We allocated the overall activity to the sectors based on national estimates from MSHA and the direct employment of mine workers in each sector.

Data on the contribution to GDP and labor income by state are derived from the IMPLAN model 2012 multipliers applied to 2017 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. We therefore allocated the cross-state indirect and induced employment, labor income, and contribution to GDP effects across the 50 states and the District of Columbia in proportion to each state's share of the total national employment, labor income, and contribution to GDP by industry. The state level indirect and induced effects reported throughout this study include such allocations of cross-state spillover effects.

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 Goal 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).

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