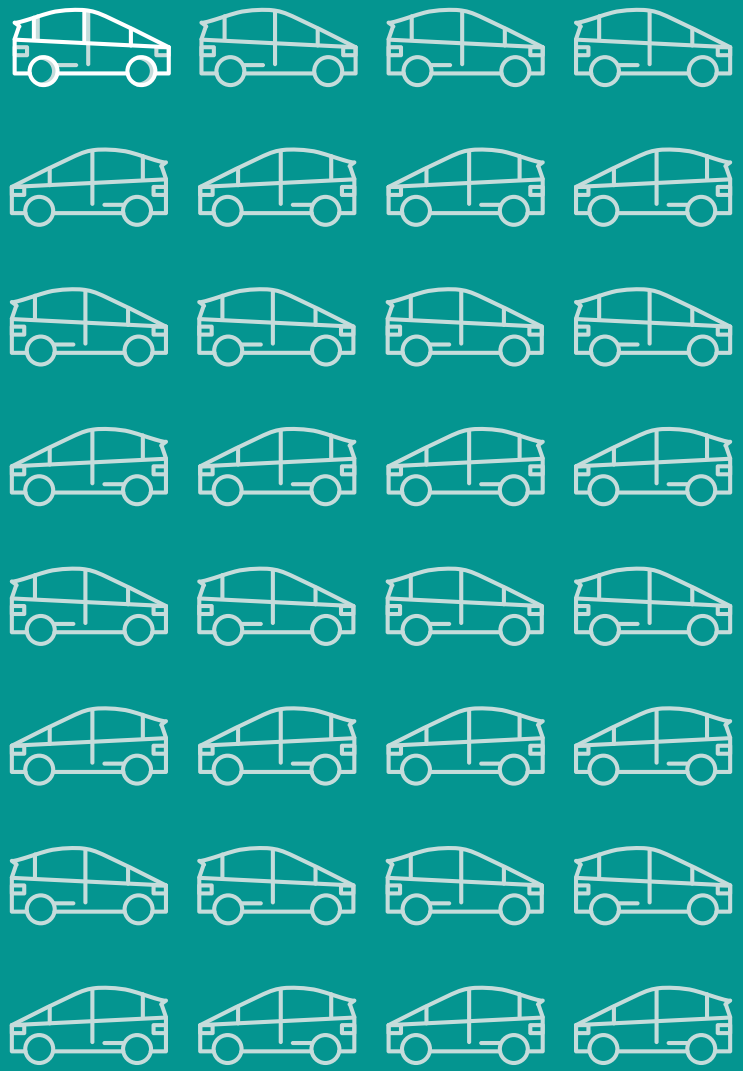
The National Mining Association

2023 Mining Facts

NMA
National
Mining
Association



If ever there were doubts around the necessity of mining, 2022 put those doubts to rest. From the minerals access required for electrification and future energy technologies, to coal availability that held off blackouts and the worst of energy inflation during a global energy crisis, mined materials make today's world possible and will make tomorrow's goals realistic.

While public awareness of mining's importance is at a high, and agencies across the government - from the Department of Defense to the Department of Energy - are engaged in programs designed to unlock our domestic mining potential, real progress lags. For all of the rhetoric, few mines are receiving the required approvals, essential permitting reform has yet to materialize, energy markets fail to recognize and properly value reliable transmission, rail service continues to under-perform, and carbon capture technologies need vastly more government support.

The mining industry stands ready to deliver the materials required for nearly every industry, feeding our manufacturing, technology, transportation, medical, defense and energy supply chains. We must work together to drive elected officials and decisionmakers to create a policy environment that will support industry's ability to provide the resources for a better future.

America's Mining at a Glance

472,000
Number of direct mining industry jobs.*

813,000
Number of indirect jobs generated by the mining industry.

$85,000+
Average annual salary for a miner, well above the U.S. average wage of $68,000.

$119B
Annual U.S. revenues generated through mining.

*Employment numbers based on MSHA Q4 2022 preliminary employment data, applied to IMPLAN 2018 data economic multipliers.

Every American uses an average of

40,000 pounds

of newly mined materials every year, including two tons of coal.

375,000
Direct minerals mining jobs

97,000
Direct coal mining jobs

595,000
Indirect minerals mining jobs

217,000
Indirect coal mining jobs

$18,000,000
Total federal, state and local taxes attributable to mining jobs

***Employment numbers based on MSHA Q4 2022 preliminary employment data, applied to IMPLAN 2018 data economic multipliers.**

Resources for Our Economy

Mining provides essential materials and power for nearly every industry and consumer product, and keeps the lights on and bills low in homes and businesses across the country.

The mining industry is supported by hundreds of thousands of hardworking Americans. They are deeply proud of the contributions they make to our country each day, fueling America and supplying the materials that make our high quality of life possible and America a global leader in innovation.

88%

Percent increase in the number of minerals for which the U.S. is entirely import dependent since 1995.

$6B

Value of minerals the U.S. imports from foreign countries, despite being home to reserves estimated at $6.2 trillion.

$2.45B

Amount of platinum, which is used in 20 percent of all manufactured goods, the U.S. imported from Russia in 2021.

#1

China is the #1 supplier of nonfuel mineral commodities for which the United States was 50%+ import reliant in 2022.

43%

Percentage of minerals identified as critical to U.S. and national security for which the U.S. is more than 50% import reliant.

Resources for Supply Chain Security

Metals and minerals are the building blocks of our auto, energy, manufacturing, technology, defense and medical supply chains.

Our reliance on foreign countries and geopolitical rivals for minerals we could be sourcing here at home exposes our economy and way of life to unacceptable risks.

Despite being home to one of the world's leading minerals reserves, cumbersome permitting processes contribute to the U.S. remaining import-dependent for many key minerals. In 2022, imports made up more than one-half of the U.S. apparent consumption for 51 nonfuel mineral commodities, and the United States was 100% net import reliant for 15 of those.

Resources for a Better Future

Technologies made possible through, and employed by, mining stimulate innovation; providing the necessary resources for a better life and a better future.

1,000%
Projected increase in demand for minerals needed for future energy technologies, according to the Center for Strategic and International Studies.

41
Number of carbon capture, use and storage facilities under construction or operating around the world.

4.7 tons
Amount of copper needed for a single wind turbine.

105%
Increase in global nickel demand by 2030 for transportation technologies.

35%
CO_2 emissions reductions achieved through high efficiency, low emissions coal plants.

8x
Increase in global lithium needed by 2030 just to meet Tesla's electric vehicle needs.

4,000%
Increase in lithium demand by 2040 under the International Energy Agency's Sustainable Development Scenario.

6x
A typical electric car requires six times the mineral inputs of a conventional car.

330 metric tons
Amount of gold the technology sector required in 2021 for connectors, switch & relay contacts, soldered joints, connecting wires, and connection strips.

What resources play a key role in your state?

coal, copper, gold, iron ore, molybdenum, zinc, uranium, lead, rare earths, platinum-group metals, salt, gypsum, silver, nickel, phosphate, boron, limestone, kyanite, beryllium, cobalt, bentonite, bromine, cement, common clays, diatomite, feldspar, gemstones, greensand marl, helium, magnesium metal, palladium, peat, potash, sand and gravel, soda ash, stone, tripoli, wollastonite, zirconium

Alabama
Coal, cement, stone, lime, sand and gravel, kyanite, common clays

Alaska
Coal, zinc, gold, lead, silver, sand and gravel

Arizona
Coal, copper, molybdenum, sand and gravel, cement, stone, silver

Arkansas
Coal, bromine, stone, cement, gypsum, sand and gravel, lime

California
Sand and gravel, cement, boron, stone, gold

Colorado
Coal, molybdenum, sand and gravel, cement, gold, stone

Connecticut
Stone, sand and gravel, common clays, gemstones

Delaware
Stone, sand and gravel, magnesium, gemstones

Florida
Phosphate rock, stone, cement, sand and gravel, zirconium

Georgia
Clays, stone, cement, sand and gravel, barite, gemstones

Hawaii
Stone, sand and gravel, gemstones

Idaho
Phosphate rock, sand and gravel, silver, lead, stone

Illinois
Coal, sand and gravel, stone, cement, tripoli

Indiana
Coal, stone, cement, lime, sand and gravel

Iowa
Stone, cement, gypsum, sand and gravel, lime

Kansas
Coal, helium, cement, salt, stone, sand and gravel, gypsum

Kentucky
Coal, stone, lime, cement, sand and gravel, common clays

Louisiana
Coal, salt, sand and gravel, stone, lime

Maine
Sand and gravel, cement, stone

Maryland
Coal, cement, stone, sand and gravel

Massachusetts
Stone, sand and gravel, lime, common clays

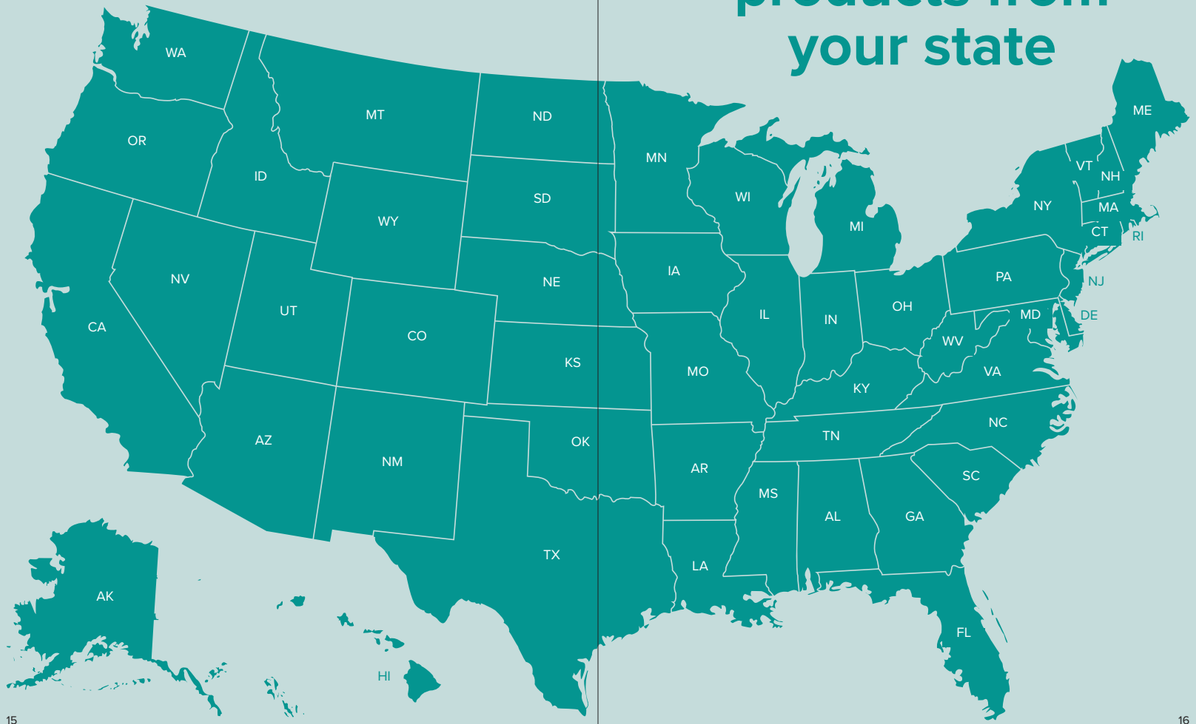
Michigan
Iron ore, cobalt, cement, nickel concentrates, stone, sand and gravel, salt

Minnesota
Iron ore, sand and gravel, stone, lime

Mississippi
Coal, sand and gravel, stone, clays (fuller's earth, ball, bentonite)

Missouri
Coal, cement, stone, lead, lime, sand and gravel

Major mined products from your state



Montana
Coal, palladium, molybdenum, copper, platinum, gemstones

Nebraska
Cement, sand and gravel, stone, lime

Nevada
Copper, gold, silver, lime, diatomite, sand and gravel, stone, gypsum

New Hampshire
Sand and gravel, stone, gemstones

New Jersey
Stone, sand and gravel, greensand marl, peat

New Mexico
Coal, copper, potash, sand and gravel, cement, salt

New York
Salt, stone, sand and gravel, cement, wollastonite, zinc

North Carolina
Stone, phosphate rock, sand and gravel, feldspar

North Dakota
Coal, sand and gravel, stone, lime, common clays

Ohio
Coal, stone, salt, sand and gravel, lime, cement

Oklahoma
Coal, stone, cement, sand and gravel, helium, gypsum

Oregon
Coal, cement, stone, lime, sand and gravel, common clays

Pennsylvania
Coal, stone, cement, lime, sand and gravel

Rhode Island
Sand and gravel, stone, gemstones

South Carolina
Cement, stone, sand and gravel, gold

South Dakota
Gold, cement, sand and gravel, stone, lime

Tennessee
Coal, stone, zinc, cement, sand and gravel, clays

Texas
Coal, stone, gypsum, sand and gravel, cement, salt, lime

Utah
Coal, molybdenum, copper, magnesium metal, potash, salt, beryllium

Vermont
Stone, sand and gravel, talc, gemstones

Virginia
Coal, stone, cement, sand and gravel, lime, kyanite

Washington
Sand and gravel, stone, gold, cement, zinc, diatomite

West Virginia
Coal, stone, cement, lime, sand and gravel

Wisconsin
Sand and gravel, stone, lime

Wyoming
Coal, soda ash, bentonite clays, helium, uranium, sand and gravel, cement

20%
Portion of U.S. electricity that comes from coal.

18%
Portion of electricity generated from nuclear energy powered by uranium.

29
Number of minerals it takes to deliver electricity to our homes and businesses.

85%
Portion of U.S. fossil energy reserves (coal, natural gas and oil) that comes from coal on a BTU basis.

170,000 kg
Amount of steelmaking coal used in the average wind turbine.

22%
Portion of total world coal reserves held by the U.S.—the most of any country.

300+
Number of new mines needed by 2035 if material supply is to keep up with battery demand.

40+
Number of U.S. coal plant closures delayed in 2022 due to reliability concerns.

Resources That Power Our Lives

Electricity should be accessible and affordable to all.

Resource diversification — powered by a mix of domestic coal, natural gas, nuclear power, oil and renewable sources — ensures that U.S. households and businesses can minimize market disruptions and reduce reliance on foreign energy sources.

New technologies, such as advanced coal-fired power generation and carbon capture and storage, will give Americans energy choices that are aligned with environmental and climate objectives without having to sacrifice reliability or affordability.

Resources for America's Infrastructure

America's miners play an indispensable role in powering and building our nation.

From foundations to roofs, power plants to wind farms, roads and bridges to communications grids and data storage centers — America's infrastructure projects begin with mining.

Roads, railways, appliances, buildings, stadiums, bridges, airports and other structures are supported by steel — a material dependent on mining. Even structures using concrete employ steel for reinforcement. And copper's flexibility, conformity, thermal and electric conductivity, and resistance to corrosion make it an ideal industrial metal.

70%
Portion of the world's steel that requires coal for its production.

46%
Portion of U.S. copper demand that goes to the construction industry.

6B
Tons of steel used in the U.S. National Highway System.

439 lbs
Amount of copper used in the average American home.

57,000 tons
Steel contained in the Empire State Building, which also includes 730 tons of aluminum and stainless steel.

67%
Portion of global zinc consumption used to coat steel, making it highly resistant to corrosion.

85%
Portion of U.S. nickel consumed to make heat and corrosive resistant alloys.

Caring for Our People

Ensuring the safety and health of our colleagues is a core value of the mining industry.

61%
Portion by which injuries in U.S. mines have been reduced over the last 15 years.

57%
Portion by which fatalities in U.S. mines have been reduced over the last 15 years.

The goal? Zero fatalities and injuries. To achieve our shared goal, we go beyond what is required by regulations. To accelerate the pace of mine safety improvement, the U.S. mining industry has taken voluntary steps to implement best practices that encourage a culture of safety.

By identifying and eliminating potential hazards and deploying state-of-the-art technology, the National Mining Association, its members and respected industry safety and health professionals have developed CORESafety®, an award-winning safety framework that is bringing more miners home safely after every shift, giving mining a lower nonfatal injury and illness record than manufacturing, construction or private industry.

Caring for the Environment

Natural resources are at the heart of mining—environmental stewardship is imperative.

Today's mining projects begin with extensive environmental and engineering studies, public involvement in major decision-making, and compliance with scores of state and federal laws and regulations governing every facet of the environment, from wildlife habitat protection to complying with strict water quality standards. They end with land reclamation that transforms sites for recreation, wildlife enhancement and other local community needs.

Building on the extraordinary environmental progress made in recent decades, the industry is committed to advancing technologies that make the use of our resources cleaner and more efficient. Today's technologies are making combustion of coal more efficient, with reduced emissions. And ongoing advancements in high efficiency, low emission (HELE) coal technologies and carbon capture and storage (CCS) hold promise for the future.

$100B
Amount coal plant owners have invested in advanced emissions control technologies over the last 20 years.

3M
Acres of mined land that have been restored by U.S. mining companies.

$11B+
Amount the U.S. mining industry has paid to reclaim mines that were abandoned prior to laws requiring reclamation.

Speaking of Mining: Key Industry Terms

Alloy: A substance with metallic qualities that is composed of two or more chemical elements, of which at least one is an elemental metal.

Anthracite: See "ranks of coal."

Auger mining: Form of underground mining that uses an auger (rotary drill) to penetrate, break and transport drilled material onto a waiting conveyor belt. Usually employed to recover remaining material in deep overburden areas that cannot be reached economically by further contour or area mining.

Base metals: Any of the non-precious metals. Copper, lead and zinc are usually considered the primary base metals, but tin, aluminum and magnesium are also among those important to modern society.

Bioleaching: Addition of naturally occurring bacteria to extract or remove a soluble substance from ore.

Bituminous coal: See "ranks of coal."

Bond: A prerequisite for obtaining a mining permit, companies must post a reclamation bond to ensure sufficient funds to restore a site in the event a company fails to complete the reclamation plan approved in the permit.

Btu: British thermal unit. This is a measure of the energy required to raise the temperature of one pound of water one degree Fahrenheit. On average, coal contains about 20 million Btu per ton.

Bullion: Mixture of gold and silver in cast bars. Also called dore.

Captive mine: A mine whose resource is used largely or totally by its owners or a subsidiary operation.

Clean coal technologies: A number of innovative technologies designed to reduce emissions and use coal in a more efficient manner. These include processes applied before, during and after combustion, and involve those which change coal into a gas or liquid.

Coal seam: A bed or stratum of coal. Usually applies to a large deposit.

Coke: A hard, dry carbon substance produced by heating coal to a very high temperature in the absence of air. Coke is used in the manufacture of iron and steel.

Concentrate: The result of separating ore or metal from its containing rock or earth.

Continuous miner/mining: A mining machine and technique that removes coal from the face and loads it onto cars or conveyors without the use of cutting machines, drills or explosives and without interrupting the loading process. Can be highly automated and operated by remote control.

Conventional mining: A deep mining method that includes inserting explosives in a seam, blasting the seam and removing the material onto a conveyor or shuttle car. Accounts for about 9 percent of total underground coal production.

Demonstrated reserves: Deposits that are potentially minable on an economic basis with existing technology.

Dragline: A large excavation machine used in the surface mining process to remove overburden (see "overburden"). The dragline has a large bucket suspended from the end of a huge boom (275 feet long or larger) that is capable of scooping up vast amounts of overburden as it is dragged across the excavation area. The dragline, which can "walk" on huge pontoon-like "feet," is one of the largest land-based machines in the world.

Drift mine: A mine entered directly through a horizontal opening drilled into the side of a hill or mountain. This mining method is used in hilly or mountainous areas.

Electrostatic precipitator: An electrical device used in removing particles (see "fly ash") from combustion gases prior to release from a power plant's stack.

Excavator: A large number of power-operated digging and loading machines, used increasingly in open-pit mining and quarrying.

Face: The surface where mining work is occurring.

Flotation: Separating ore from waste materials by floating away the materials of lower specific gravity, while the heavier materials sink.

Fluidized-bed combustion: Process to remove sulfur from coal combustion and limit the formation of nitrogen oxides (see "clean coal technologies"). The process involves suspending crushed coal and limestone in the bottom of a boiler by an upward stream of hot air. While the coal is burned in this liquid-like mixture, sulfur from combustion gases combines with the limestone to form a solid compound recovered with the ash.

Fly ash: Particles of ash entrained in gases resulting from the combustion of fuel. At coal-fired power plants, fly ash is captured by special equipment, usually either electrostatic precipitators or baghouses. Fly ash and other forms of coal ash are useful by-products — about 25 million tons are used each year in major concrete projects, such as highway construction.

Fossil fuel: Fuel such as coal, crude oil or natural gas, formed from the fossil remains of organic material.

Gasification: Any of various processes by which coal is turned into low, medium or high-Btu gas.

General Mining Law: The primary statute that governs the right to mine locatable minerals on unappropriated public domain lands. Though enacted in 1872, it has been amended many times.

Hardrock minerals: Locatable minerals that are neither leasable minerals (coal, oil, phosphate, etc.) nor saleable mineral materials (sand and gravel, etc.). Hardrock minerals include copper, lead, zinc, magnesium, nickel, tungsten, gold, silver, bentonite, barite, feldspar, fluorspar and uranium.

Highwall: Unexcavated face of exposed overburden and coal in a surface mine or in a face or bank on the uphill side of a contour mine excavation.

In situ gasification: The gasification of underground coal deposits through partial combustion.

Leaching: The action of percolating liquid in order to remove the soluble parts. For example, cyanide leaching of gold is a process where a weak cyanide solution is percolated through low-grade ore heaped on an impermeable liner. Gold is then extracted from the liquid in a closed-loop system.

Lignite: See “ranks of coal.”

Liquefaction: The process of converting coal into a synthetic liquid fuel, similar in nature to crude oil and/or refined products, such as gasoline.

Locatable minerals: Those minerals — primarily metallic — that can be claimed and mined on public lands under the General Mining Law of 1872; these do not include coal, oil, phosphate sodium, sulfur, or sand and gravel.

Longwall miner/mining: A deep mining machine and technique that uses a steel plow or rotating drum, which is pulled mechanically back-and-forth across a long face of coal to loosen it and collect the product on a conveyor for removal from the mine.

Metallic minerals: Minerals with a high specific gravity and metallic luster, such as titanium, rutile, tungsten, uranium, tin, lead and iron. In general, metallic minerals are good conductors of heat and electricity.

Metallurgical coal: Various grades of coal suitable for carbonization to make coke for steel manufacturing.

Minerals:
Scientific: naturally formed inorganic solids (elements or chemical compounds) with a limited range in chemical composition and with orderly internal atomic arrangements that determine crystalline structure and physical properties.

Legal: organic or inorganic substances occurring naturally, with characteristics and economic uses that bring them within the purview of mineral laws; substances that may be obtained under the applicable laws from public lands by purchase, lease or claim.

Mining claim: That portion of the public mineral lands that a person may claim for mining purposes in accordance with the General Mining Law of 1872, as amended. There are four types of mining claims: lode, placer, millsites and tunnel sites. Only tunnel sites may not be patented under current law.

Mountaintop mining: A method of surface mining practiced in the Appalachian coal fields of the eastern United States. Mountaintop mining allows the mine operator to completely remove layers of dirt and rock covering a coal seam, making the entire deposit economical for extraction. Valley fill — the depositing of rock and dirt from the surface mine into adjacent valleys — is a practice that is not unique to the mining industry; hundreds of valley fills were constructed throughout the country during the building of the Interstate Highway System.

Non-metallic minerals: Minerals (carbon, diamond, coals, bitumen, asphalt, boron, sulfur, rock salt, etc.) that lack the properties of the metallic minerals.

Non-renewable resources: Resources that are not replaced or regenerated naturally within a reasonable period of time, such as fossil fuels or minerals.

Open pit: A mine or excavation open to the surface. Refers primarily to mines of metal ores; distinguished from coal surface mines.

Ore: Rock that contains important minerals, including metals.

Outcrop: Coal that appears at or near the surface.

Overburden: Layers of earth and rock covering a coal seam or mineral deposit.

Patent: A government deed; a document that conveys legal title to public lands to the patentee.

Placer deposit: An alluvial marine or glacial deposit resulting from the crumbling and erosion of solid rocks, and often containing valuable minerals.

Portal: Entrance to a mine.

Preparation plant: A facility, usually located on a mine site, which crushes, sizes and washes material prior to shipment.

Ranks of coal: The classification of coal by degree of hardness, moisture and heat content. The major ranks, from lowest to highest quality, are lignite, subbituminous, bituminous and anthracite.

Reclamation: The restoration of land and environmental values to a mining site after mining occurs.

Recoverable reserves: Portion of reserves that can be economically and physically mined using current techniques after allowing for normal mining losses.

Reserves: Known identified resources from which a usable commodity can be technologically, economically and legally extracted using current mining techniques.

Rock dusting: The process of coating tunnels in deep mines with powdered limestone to dilute potentially unhealthy or dangerous concentrations of dust and minimize fire hazards.

Roof bolting: A method of supporting the ceilings of underground mines by inserting long steel bolts into holes bored into the strata forming the roof.

Scrubber: Any of several forms of chemical/physical devices that remove sulfur compounds formed during coal combustion. Technically known as flue gas desulfurization systems, they combine the sulfur in gaseous emissions with another chemical medium to form an inert sludge.

Slope mine: A mine with an opening that slopes upward or downward to the seam. It must also have adjoining vertical shafts for air ventilation and emergency use.

Smelter: A furnace in which raw materials are melted, and metals are separated from impurities.

Stope: An excavation from which ore has been removed in a series of steps.

Strategic minerals: Those minerals considered essential for a country’s economic and defense needs, such as metals for defense weapons, satellite communications, automobile parts and medical instruments.

Subbituminous coal: See “ranks of coal.”

Surface mine: A mine in which the coal lies near the surface and can be extracted by removing the covering layer of overburden.

Tailings: The waste material left over after hardrock mining and milling processes have been completed.

Tipple: A surface processing structure for cleaning and sizing coal and automatically loading it onto rail cars or trucks for movement to market.

Underground mine: Also known as a deep mine. Usually located several hundred feet below the earth’s surface, materials are removed mechanically and transferred by shuttle car or conveyor to the surface.

Unit train: A long train of between 60 and 150 or more hopper cars, carrying only coal between a single mine and destination. A typical unit train can carry at least 10,000 tons of coal in a single shipment.

America's mining industry supplies the essential materials necessary for nearly every sector of our economy — from technology and healthcare to energy, transportation, infrastructure and national security.

The National Mining Association (NMA) is the only national trade organization that serves as the voice of the U.S. mining industry and the hundreds of thousands of American workers it employs before Congress, the federal agencies, the judiciary and the media, advocating for public policies that will help America fully and responsibly utilize its vast natural resources. We work to ensure America has secure and reliable supply chains, abundant and affordable energy, and the American-sourced materials necessary for U.S. manufacturing, national security and economic security, all delivered under world-leading environmental, safety and labor standards.

Headquartered in Washington, D.C., the NMA has a membership of more than 250 companies and organizations involved in every aspect of mining, from producers and equipment manufacturers to service providers.

101 Constitution Avenue NW, Suite 500E
Washington, D.C. 20001

nma.org