American Mining for America's INFRASTRUCTURE and ENERGY

Background and Overview

- ***Metallurgical coal*** is used in the steel-making process, which is critical to America's infrastructure. ***Thermal or steam coal*** is used to generate affordable, reliable 24/7/365 electricity to power our economy and is a fuel source for industrial plants producing cement and chemicals.
- Coal power plants are critical to baseload electric generation and grid reliability and resilience; the existing U.S. coal fleet must be preserved. During the early 2018 Bomb Cyclone weather event, coal plants provided 55% of the demand surge across six electricity regions, keeping lights and heat on and avoiding electricity shortages.
- Protracted, costly, and uncertain mine permitting processes thwart development of America's coal resources, which are more abundant than in any other country.
- Coal exports improve our nation's balance of trade and support jobs throughout the coal supply chain. U.S. coals offer a superior source of supply and product quality. Our mines operate under stringent environmental requirements, unlike some other countries with lesser operating and environmental standards.

Regulatory Issues	• Continue EPA regulatory reforms for coal use in the power sector: ▪ Replace the Clean Power Plan with the Affordable Clean Energy Rule (ACE) to reduce CO_2 emissions from existing plants by over 30% from 2005 levels. Support New Source Review program provisions to provide regulatory certainty to implement the efficiency improvements to comply with ACE. ▪ Replace the CO_2 regulation for new plants with EPA's proposed rule establishing the requirement for large new plants to use widely available supercritical technology. ▪ Support reasonable costs, achievable timeframes, and flexibility for power plant regulations for wastewater discharge and coal combustion residuals. • Support completion of mine permit reviews in less than two years. • Support continued actions to reduce agency overlap and coordinate federal permit reviews including environmental (NEPA) reviews. • Remove barriers to building new coal export terminals and expanding existing terminals to increase U.S. coal exports.

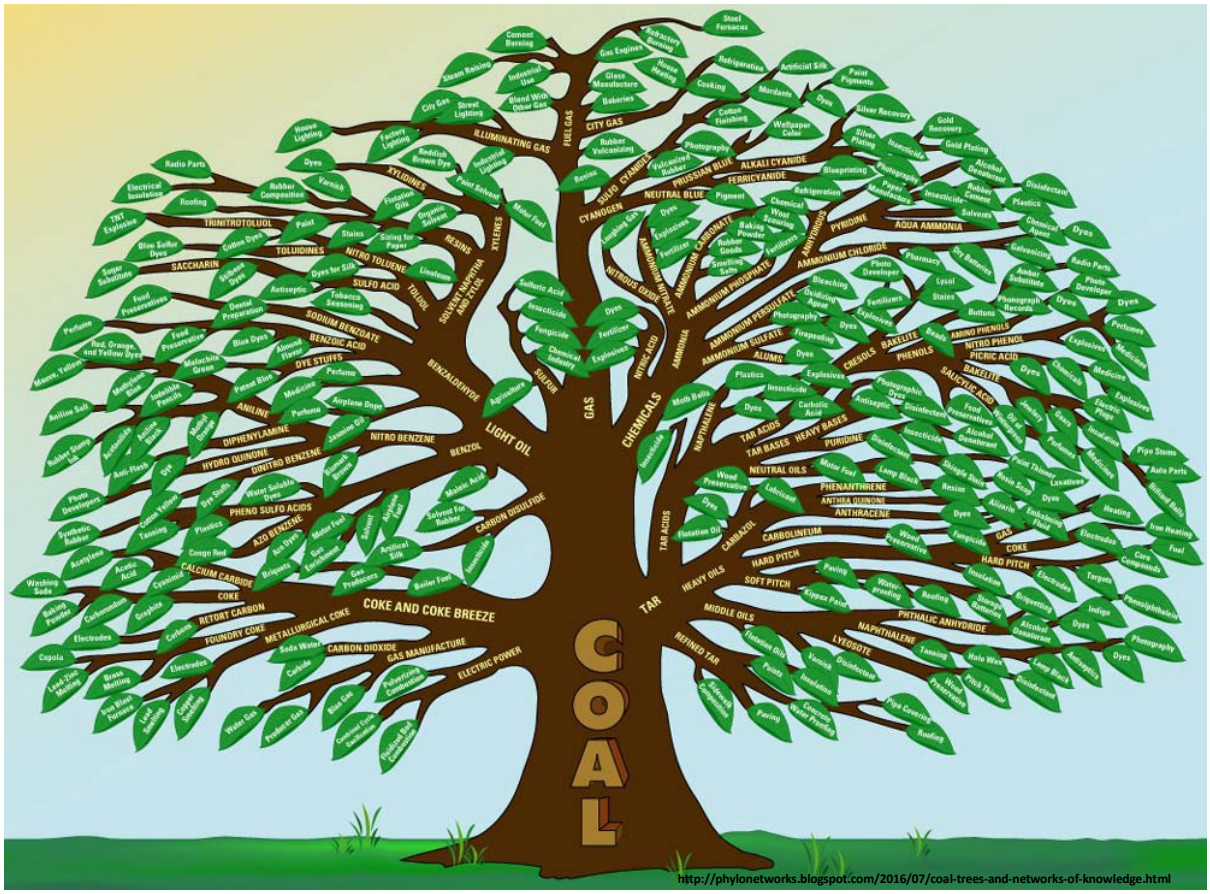
Congressional Issues	
	• Support **H.R. 172** ***New Source Review Permitting Improvement Act*** introduced by Rep. Morgan Griffith (R-Va.) to streamline the permitting process for expanding, upgrading, or otherwise modifying power plants and manufacturing facilities. • Support **H.R.1796** ***Carbon Capture Modernization Act*** introduced by Rep. David McKinley (R-WV) and Rep. Colin Peterson (D-MN) to modify eligibility standards for CCUS applications to improve technological/economic feasibility for retrofit projects. • Support **S. 383** ***Utilizing Significant Emissions with Innovative Technologies or USE IT*** **Act** reintroduced by Sen. John Barrasso, (R-WY) and Sen. Sheldon Whitehouse, (D-RI), to encourage reduction of carbon dioxide emissions by stimulating development of carbon capture, utilization, and storage technologies (CCUS), and innovative ways to convert carbon to useful products. • Support reintroduction of **H.R. 5270** ***Electricity Reliability and Fuel Security Act*** (Rep. Larry Bucshon, R-IN), and similar bills **S. 2861** (Sen. Joe D. Manchin, D-WV) and **S. 2677** (Sen. Shelley Moore Capito, R-WV). They provide a temporary 5-year, 30% tax credit for existing coal power plant O&M to help sustain the U.S. coal fleet. • Support robust funding of DOE's Fossil Energy R&D program. • Support maintaining coal excise tax at the current level, thus providing revenues above the level needed to pay recipients from the black lung disability fund. Reimposing the previous higher rate would cost industry $200 million more in taxes and risks industry employment, stability, and competitiveness. • Oppose **S. 1193** introduced by Sen. Joe Manchin, D-WV to extend the Abandoned Mine Land (AML) tax 15 years beyond its current 2021 expiration. The existing balance in the fund is sufficient to reclaim remaining high priority sites that have gone unaddressed over the years without a further extension of the tax that would unnecessary burden the industry. • Oppose **H.R.2050** ***Appalachian Communities Health Emergency Act*** **(ACHE Act)** (Rep. Yarmuth, D-KY – co-sponsored by Rep. Ocasio-Cortez, D-NY, Rep. Schiff, D-CA, & Rep. Grijalva, D-AZ). Potential significant negative impacts to all surface coal mining in Kentucky, Tennessee, West Virginia, and Virginia as well as potential impacts to all surface coal mining activities nationwide, based on definitions provided in the Act. Applies to new coal permits or expansions of existing permits.

Coal is Essential to an All-Of-The-Above U.S. Energy Policy

Coal & You

An average American's residential and transportation energy consumption would require the burning of approximately 15,000 pounds of coal a year. That equals out to nearly 41 pounds of coal a day. If coal powered everything, every few days you would consume your body weight in coal.

Source: Energy Information Administration



Different types of **Coal** have different uses worldwide.

- Steam Coal - also known as thermal coal, mainly used in power generation (~6.8 billion tons annually)
- Coking Coal - also known as metallurgical coal, is mainly used in steel production (~1.0 billion tons annually)

Other important worldwide uses of **Coal** include:

- Cement Manufacturing (~300 million tons annually),
- Paper mills (~150 million tons annually), and;
- Carbon Chemicals (~150 million tons annually)

Coal is also used in alumina refineries and by chemical and pharmaceutical industries. Several chemical products can be produced from the by-products of coal. Refined coal tar is used in the manufacture of chemicals, such as creosote oil, naphthalene, phenol, and benzene. Ammonia gas recovered from coke ovens is used to manufacture ammonia salts, nitric acid, and agricultural fertilizers. Thousands of different products have coal or coal by-products as components: soap, aspirins, solvents, dyes, plastics and fibers, such as rayon and nylon.

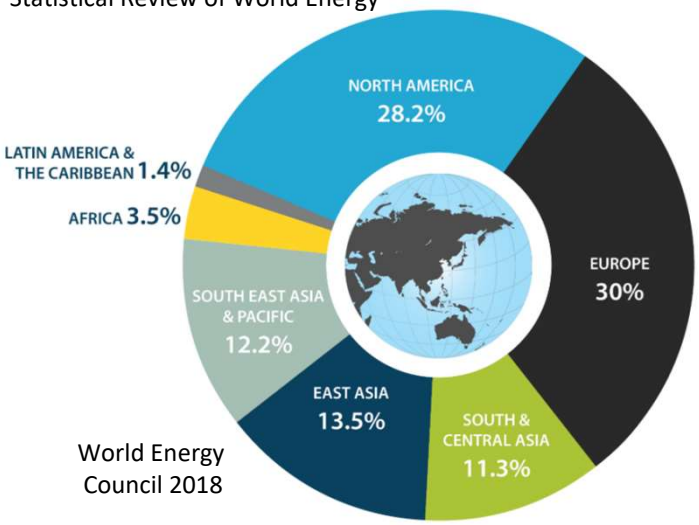
Coal is also an essential ingredient in the production of specialist products:

- Activated Carbon - used in filters for water and air purification and in kidney dialysis machines.
- Carbon Fiber - an extremely strong but lightweight reinforcement material used in construction, mountain bikes and tennis rackets; and
- Silicon Metal - used to produce silicones and silanes, which are in turn used to make lubricants, water repellents, resins, cosmetics, hair shampoos, and toothpastes.

For more info visit WMC-USA.org or contact wearewmc@wmc-usa.org

The U.S. has more coal than any other country in the world: 22%

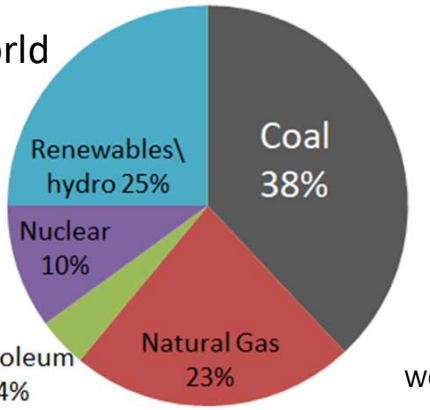
BP Statistical Review of World Energy



World Energy Council 2018

The world relies on coal for electricity

World



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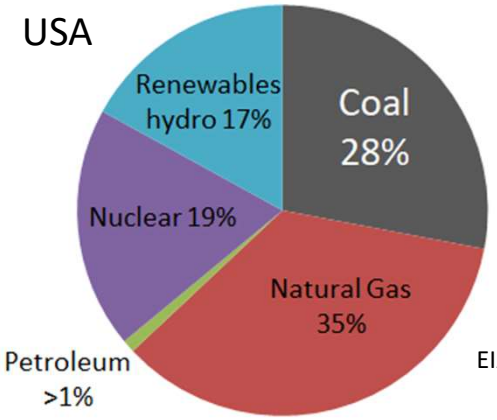
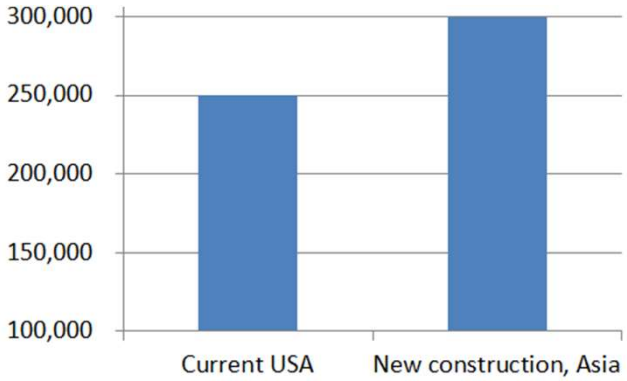
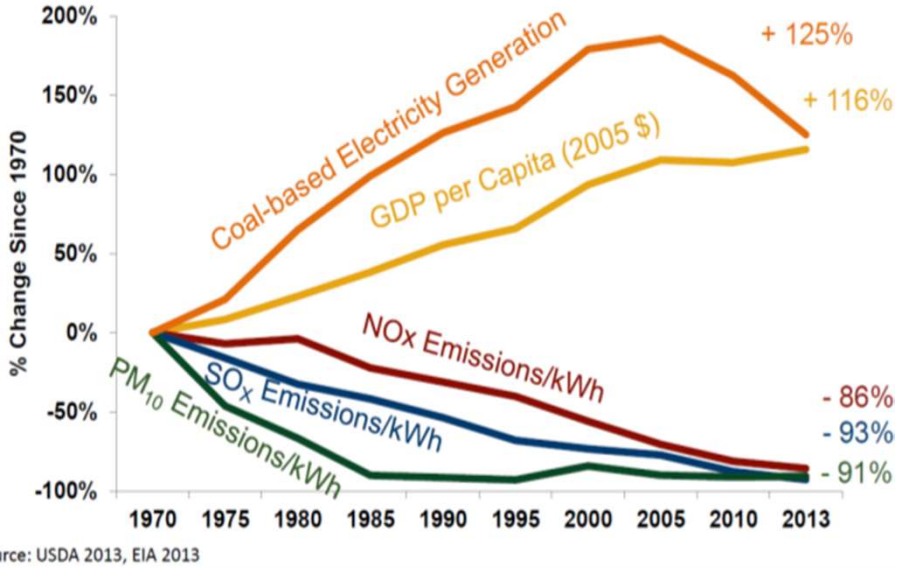


EIA

New coal plant construction in Asia is larger than US fleet (MW)



With technology, Coal gets cleaner



Source: USDA 2013, EIA 2013

1990-2010: 1.7 Billion people gain access to electricity

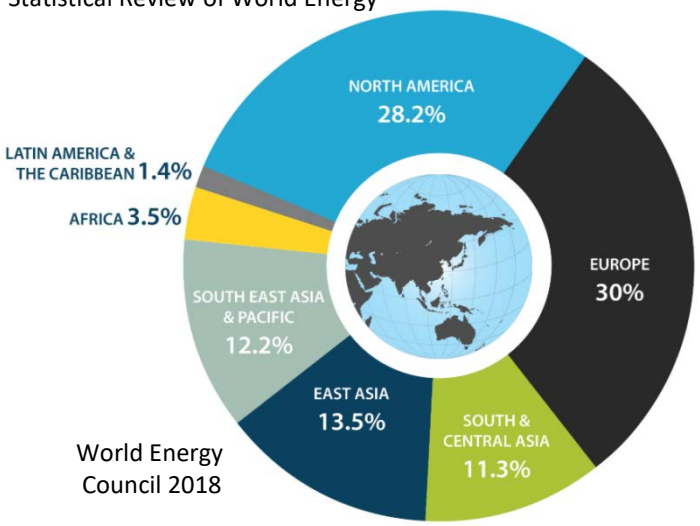
Thanks to coal:

Thanks to wind & solar:

Manhattan Institute

The U.S. has more coal than any other country in the world: 22%

BP Statistical Review of World Energy



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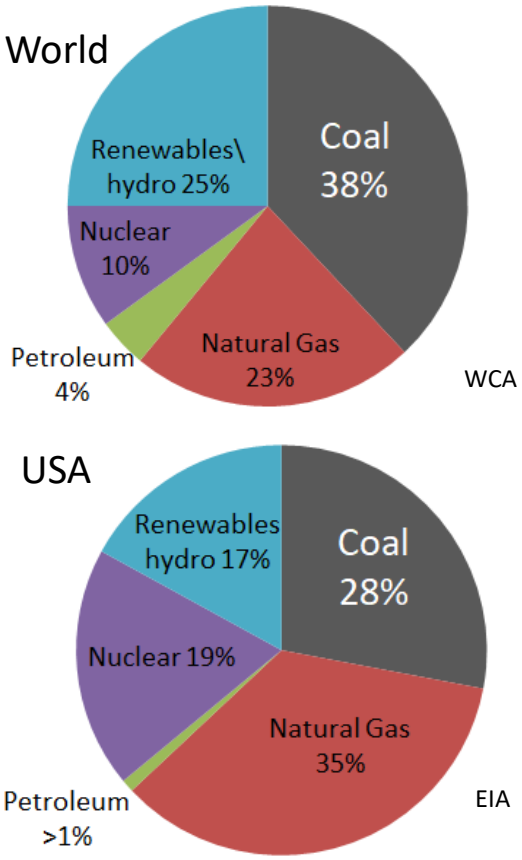

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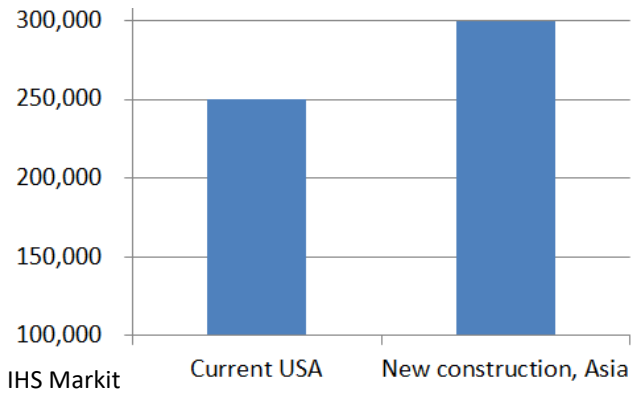
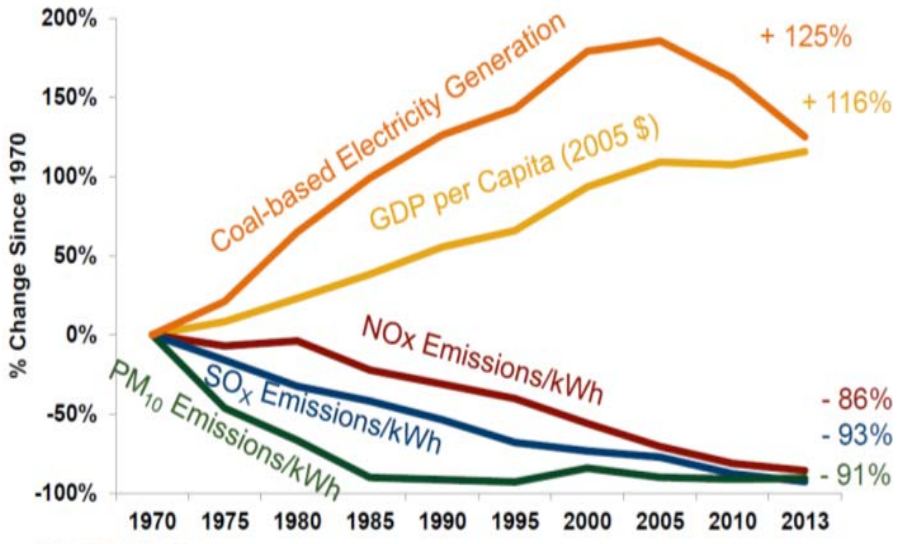


IHS Markit

With technology, Coal gets cleaner



Source: USDA 2013, EIA 2013

1990-2010: 1.7 Billion people gain access to electricity

Thanks to coal:

Thanks to wind & solar:

Manhattan Institute

American Mining for America's INFRASTRUCTURE

Domestic Minerals Provide Infrastructure, Raw Materials, & Supply Chain Stability

Congressional Issues	
Legislation Ensuring Access to Public Lands for Mineral Exploration & Production	• End 30-year stalemate - take action on and resolve BLM's Wilderness Study Area (WSA) recommendations • Oppose legislation seeking to create additional wilderness areas, or other land withdrawals, thereby limiting or eliminating access for exploration and mining activities
Oppose Rep. Grijalva's Proposed 1872 Mining Law Revisions	• Potential flaws include: ▪ Lack of secure land tenure ▪ Changing from a self-initiation (claims) system to a leasing system ▪ Proposed imposition of unjustifiable & inequitable federal royalty and "disposal fees" ▪ Proposed creation of duplicative and cumbersome laws & regulations while ignoring existing programs **NOTE: See *Mining Law Reform* handout for additional details on this topic**
Critical and Strategic Minerals, Indispensable for Our Infrastructure and National Security	• Indispensable to America's infrastructure, economy & defense • Critical Minerals Executive Order 13817 mandates increasing domestic minerals exploration, development, and related research • Legislative policies related to infrastructure and energy need to be aligned with the Executive Order 13817
Abandoned Mine Lands	• Support Good Samaritan AML legislation for cleaning up historical sites and providing liability protection to operators undertaking the cleanups

Administrative Issues	
Permit Streamlining ***Permitting Delays Contribute to Import Reliance***	Protracted, costly, and uncertain permitting process thwarts exploration & development of America's mineral resources • Support legislation to reform permit process • Permitting barriers risk $9.2 billion in investment, 16,500 high-paying jobs, and $5 billion in taxes (AEMA 2018 survey)
BLM ***Improve NEPA Timelines Minimize Land Withdrawals and Land Use Restrictions***	• Complying with Federal Register publication process is an important step in permit streamlining • Uniform implementation of NEPA Streamlining: Secretarial Order 3355 is crucial to removing permitting uncertainty on BLM-administered lands • Retain state boundaries for BLM management structure
Forest Service ***Improve NEPA Timelines Minimize Land Withdrawals***	• Adopt BLM's Notice process for small-scale exploration projects • Develop NEPA streamlining policy similar to DOI's • Revise Sage Grouse Land Use Plans to better align with DOI's plans
EPA ***Abandoned Mine Lands***	• Coordination with existing state, BLM, & USFS AML programs will provide the most beneficial outcome to cleanups
DOI ***Critical and Strategic Minerals, Indispensable for Our Infrastructure and National Security***	• USGS final critical minerals list is inconsistent with EO critical minerals definition – revise to include infrastructure minerals

American Mining for America's INFRASTRUCTURE

Domestic Minerals Provide Infrastructure, Raw Materials, & Supply Chain Stability

www.wmc-usa.org ◆◆ wearewmc@wmc-usa.org

American Exploration & Mining Association

womensminingcoalition

Grijalva's Mining Law Bill will Destroy Private-Sector Investment in Developing the Nation's Mineral Resources and Increase our Reliance on Foreign Minerals

Mining Law Backgrounder: The 1872 Mining Law governs how U.S. citizens gain access to hardrock (also known as locatable) minerals like copper, gold, silver, zinc, lithium, cobalt, rare earths, nickel, and other minerals on federal lands. Locatable minerals are essential building blocks of our economy, infrastructure, technology, manufacturing, conventional and renewable energy, and national defense. In response to President Trump's Executive Order 13817, "*A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*," the Secretary of Interior recently finalized a list of 35 critical minerals, most of which are locatable minerals governed by the Mining Law.

The Bureau of Land Management's (BLM's) statistics show that at the end of FY 2018, there were 399,658 mining claims distributed in 19 western states, with roughly half of these claims located in Nevada. Cumulatively, mining claims cover less than 12,500 square miles scattered throughout the west. Only a small fraction of claims contain mineral deposits that are economic to mine. As a rule of thumb, hardrock mining affects about 0.1 percent of the land with mining claims.

Since its enactment in 1872, Congress has made many important changes to the Mining Law including:

The Minerals Leasing Act – In 1920, Congress removed coal, petroleum, natural gas, phosphates, sodium, sulfur, and potassium from the law and established leasing programs for these resources in part because they have different geologic characteristics than locatable minerals;

The Federal Land Policy and Management Act – In 1976, Congress created an environmental protection mandate prohibiting unnecessary or undue degradation of lands subject to mineral activities, established a claims recordation requirement that documents where claims are located and who owns mining claims, and created special environmental protection measures for claims in wilderness study areas and in the California Desert Conservation Area;

1993 to Present – Starting in 1993, Congress has used the appropriations process to establish an annual fee, the Claims Maintenance Fee, for use of federal lands for mineral exploration and development purposes, and to continue a moratorium on patenting. Claimants currently pay $155 per claim, which will increase in 2019 as the fee is adjusted every five years to reflect the CPI.

The Mining Law, as amended, invites U.S. citizens to make substantial investments of time, knowledge, and money to explore for minerals on federal lands with the hope of discovering a mineral deposit that can be developed into a mine. This process, known as "self-initiation" greatly benefits our Nation because it effectively leverages private investments that transform undeveloped federal land into mining operations that create jobs, pay taxes, and provide the minerals the country needs – at no expense whatsoever to U.S. taxpayers.

Because mineral deposits are rare and unique geologic phenomena, they are very difficult to find. Keeping lands open to exploration and development improves the odds of finding "the needle in the haystack" mineral deposit that can be developed into a mine. Conversely, withdrawing land from operation of the Mining Law and restricting the amount of land that can be explored diminishes the odds of discovery, interferes with the Mining Law's self-initiation process, and severely compromises the Nation's ability to capitalize on private-sector investments to discover and develop domestic mineral deposits. The Department of the Interior estimates that over 50 percent of federal land is *already* off limits to mining.

American Exploration & Mining ASSOCIATION

womensminingcoalition

Chairman Grijalva's Bill will Harm the Nation by Dramatically Increasing our Reliance on Foreign Sources of Minerals

Eliminates mining claims and substitutes a minerals leasing system that will substantially chill private-sector investment in exploring for and developing minerals on federal land.

- Completely destroys self-initiation;
- Creates intolerable uncertainties about lease terms, conditions, and renewal policies;
- Gives federal land managers the discretionary authority to deny a permit or revoke a lease at any stage of a project;
- Creates prospecting permits with unrealistically short time limits to discover a mineral deposit that fail to recognize that discovering minerals can take a decade or longer;
- Changes current life-of-mine permits to an arbitrary 20-year lease that may be renewed for successive 10-year terms if the mine is in continuous production, which ignores how fluctuating mineral prices influence mine operations and temporary closures. Mining occurs during periods of favorable mineral prices but may have to temporarily cease when mineral prices fall.

Puts more land off-limits to mineral exploration and development inappropriately ignoring the Nation's need for domestic minerals and increasing our reliance on foreign minerals.

- Establishes suitability criteria that will prohibit mining on lands with water resources and other environmental characteristics that completely disregard the fact that mines can only be developed where minerals have been discovered and that impacts due to mining can be mitigated.

Creates onerous and impractical environmental standards designed to make mining difficult if not impossible

- Ignores the land management agencies' current environmental protection requirements for locatable minerals, which provide effective and comprehensive environmental protection that safeguard all aspects of the environment including water resources, wildlife, special status species, air quality, cultural resources, soils, vegetation, and visual resources.
- Disregards current financial assurance programs that guarantee mines will be reclaimed. For example, Nevada state regulators and federal agencies hold over $2.8 billion in reclamation bonds for locatable mineral exploration and mining projects.
- Overlooks BLM and Forest Service mandates that mineral projects must prevent unnecessary or undue degradation/minimize adverse environmental impacts and that NEPA environmental reviews already analyze impacts; identify ways to eliminate, minimize, and mitigate impacts; and verify compliance with all applicable state and federal regulations.

Imposes a retroactive royalty on pre-existing claims that will expose the federal government to takings litigation and a confiscatory prospective royalty

- In *Union Oil Co. v Smith*, 249 U.S. 337, 348-349 (1919), the U.S. Supreme Court ruled that claim holders are entitled to extract and sell minerals "without paying any royalty to the United States as owner."
- The bill's prospective royalty does not consider existing state taxation and royalty requirements and third-party royalty agreements that typically burden mining claims or that mineral producers cannot pass on the royalty costs to mineral consumers.

Creates a Displaced Materials Fee for each ton of rock that must be moved to mine the orebody.

- This fee will render most if not all deposits uneconomic to develop, leaving minerals in the ground and further increasing our reliance on foreign minerals.

The World Bank's Climate Smart Mining/Minerals for Climate Action Initiatives Show Minerals are Essential for Renewable Energy

The World Bank recently published "The Growing Role of Minerals for a Low Carbon Future[1]," which clearly shows that wind, solar, hydrogen, and electricity systems use significantly MORE mined materials than current traditional fossil-fuel-based energy supply systems.

The World Bank's initiatives "seek to engender a broad dialogue between the mining and metals constituency and the climate change and clean energy community that recognizes that a low carbon energy shift will be very much dependent on a robust, sustainable, and efficient mining and metals industry." Their report demonstrates that climate, clean energy, and extractive industries supporters should view mineral resource development "as a complement and not competitor, to a greener, more sustainable future."

> "A transition to a low carbon society, [is] a change that will require vast amounts of metals and minerals. Mineral resourcing and climate change are inextricably linked, not only because mining requires a large amount of energy, but also because the world cannot tackle climate change without adequate supply of raw materials to manufacture clean technologies." (Nature , Allie et al 2017, p. 367)

Alarmingly, the U.S. Geological Survey's (USGS) 2019 Minerals Commodity Summary[2] shows a significant reliance on foreign imports of most of the metals that the World Bank deems essential to wind, solar, and storage batteries technologies:

World Bank's Low Carbon Energy Critical Minerals List	USGS U.S. Import Reliance	Major Import Sources
Aluminum/Bauxite	>75%	Jamaica, Brazil, Guinea
Cadmium	<25%	Canada, Australia, China
Cobalt	61%	Norway, China, Japan
Copper	32%	Chile, Mexico, Canada
Iron Ore and Steel	24%	Canada, Brazil, Korean Rep.
Lead	29%	Canada, Mexico, Korean Rep.
Lithium	>50%	Argentina, Chile, China
Manganese	100%	South Africa, Gabon, Georgia
Molybdenum	0%	N/A
Nickel	52%	Canada, Norway, Russia
Platinum Group Metals	73%	South Africa, Russia
Rare Earth Metals	100%	China, Estonia, France
Silver	65%	Mexico, Canada, Peru
Titanium	91%	South Africa, Australia, Canada
Zinc	85%	Canada, Mexico, Peru

Mining and Renewable Energy Policies Must Reflect the Essential Need for Domestic Mining
Grijalva's Mining Law Bill Conflicts with Renewable Energy Objectives

[1] Arrobas, Daniele La Porta, *et al*, 2017, The Growing Role of Minerals and Metals for a Low Carbon Future, Washington, D.C., World Bank Group

[2] U.S. Geological Survey, 2019, Mineral Commodity Summaries 2019, 200 p.

The World Bank held a conference on May 1, 2019 in Washington DC on "Mining Minerals for Climate Action – Climate-Smart Mining; The Growing Role of Minerals and Metals for a Low Carbon Future".

Of concern to the World Bank is the lack of presently identified mineral resources for the needs of generating electricity with the rapid increase of advanced technologies throughout the developing world.

For wind turbines, a 3MW turbine requires 4.7 tons of copper, 335 tons of steel, 1200 tons of concrete, 3 tons of aluminum, 2 tons of rare earth minerals, plus zinc and molybdenum. With an expected increase in wind-generated electricity of 63% by 2023, there will be a shortfall in the minerals and metals needed to meet this demand. For electric vehicles there will be a need for 10 times increase in identified resources for lithium and 2 times for nickel. No matter how much we lower the demand side of generating electricity, there are not enough mineral/metal resources identified worldwide to take care of our future's increased demands. **To reduce the global carbon footprint will require a global increase in power generation of 3.5 times by 2050.** This can only happen with mining the minerals and metals needed to build low carbon power generation.

This mineral shortage is a crisis because no one is paying attention to the mineral requirements of a digital/technical/green future.

The World Bank views mining as a "force for good" providing more people with electricity and higher standards of living.

https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action

2018 U.S. NET IMPORT RELIANCE[1]

Commodity	Percent	Major import sources (2014-17)[2]
ARSENIC (trioxide)	100	Morocco, China, Belgium
ASBESTOS	100	Brazil, Russia
CESIUM	100	Canada
FLUORSPAR	100	Mexico, Vietnam, South Africa, China
GALLIUM	100	China, United Kingdom, Germany, Ukraine
GRAPHITE (natural)	100	China, Mexico, Canada, Brazil
INDIUM	100	China, Canada, Republic of Korea, Taiwan
MANGANESE	100	South Africa, Gabon, Australia, Georgia
MICA (sheet, natural)	100	China, Brazil, Belgium, Austria
NEPHELINE SYENITE	100	Canada
NIOBIUM (columbium)	100	Brazil, Canada, Russia, Germany
RARE EARTHS (compounds and metals)[3]	100	China, Estonia, France, Japan
RUBIDIUM	100	Canada
SCANDIUM	100	Europe, China, Japan, Russia
STRONTIUM	100	Mexico, Germany, China
TANTALUM	100	Brazil, Rwanda, Australia, Congo (Kinshasa)
THORIUM	100	India, United Kingdom
VANADIUM	100	Austria, Canada, Republic of Korea, Russia
GEMSTONES	99	India, Israel, Belgium, South Africa
BISMUTH	96	China, Belgium, Mexico, Republic of Korea
YTTRIUM	>95	China, Estonia, Japan, Republic of Korea
POTASH	92	Canada, Russia, Belarus, Israel
TITANIUM MINERAL CONCENTRATES	91	South Africa, Australia, Canada, Mozambique
DIAMOND (dusts, grit and powder)	89	China, Ireland, Republic of Korea, Romania
ANTIMONY (oxide)	85	China, Thailand, Belgium, Bolivia
ZINC	85	Canada, Mexico, Peru, Australia
BARITE	84	China, India, Mexico, Morocco
RHENIUM	84	Chile, Germany, Belgium, Poland
STONE (dimension)	82	Brazil, China, Italy, Turkey
TIN	78	Indonesia, Malaysia, Peru, Bolivia
ABRASIVES, fused aluminum oxide (crude)	>75	China, France, Hong Kong, Canada
ABRASIVES, silicon carbide (crude)	>75	China, Netherlands, South Africa, Romania
BAUXITE	>75	Jamaica, Brazil, Guinea, Guyana
TELLURIUM	>75	Canada, China, Germany
TITANIUM (sponge)	75	Japan, Kazakhstan, Ukraine, China,
PLATINUM	73	South Africa, Germany, United Kingdom, Italy
CHROMIUM	71	South Africa, Kazakhstan, Russia
PEAT	70	Canada
GARNET (industrial)	68	Australia, India, South Africa, China
SILVER	65	Mexico, Canada, Peru, Republic of Korea
COBALT	61	Norway, China, Japan, Finland
NICKEL	52	Canada, Norway, Australia, Russia
GERMANIUM	>50	China, Belgium, Germany, Russia
IODINE	>50	Chile, Japan
IRON OXIDE PIGMENTS (natural)	>50	Cyprus, Spain, France, Austria
IRON OXIDE PIGMENTS (synthetic)	>50	China, Germany, Brazil, Canada,
LITHIUM	>50	Argentina, Chile, China, Russia
TUNGSTEN	>50	China, Bolivia, Germany, Canada,
ALUMINUM	50	Canada, Russia, United Arab Emirates, China
MAGNESIUM COMPOUNDS	48	China, Canada, Australia, Brazil
ALUMINA	45	Australia, Brazil, Suriname, Jamaica
SILICON	34	Russia, Brazil, Canada, China
PALLADIUM	33	South Africa, Russia, Italy, United Kingdom
COPPER	32	Chile, Canada, Mexico
VERMICULITE	30	South Africa, Brazil, China, Zimbabwe
LEAD	29	Canada, Mexico, Republic of Korea, India
PUMICE	29	Greece, Iceland, Mexico
SALT	28	Chile, Canada, Mexico, Egypt
MICA (scrap and flake, natural)	26	Canada, China, India, Japan
PERLITE	25	Greece, Mexico, Turkey
BROMINE	<25	Israel, Jordan, China
CADMIUM	<25	Canada, Australia, China, Belgium
MAGNESIUM METAL	<25	Israel, Canada, United Kingdom, Mexico
IRON and STEEL	24	Canada, Brazil, Republic of Korea

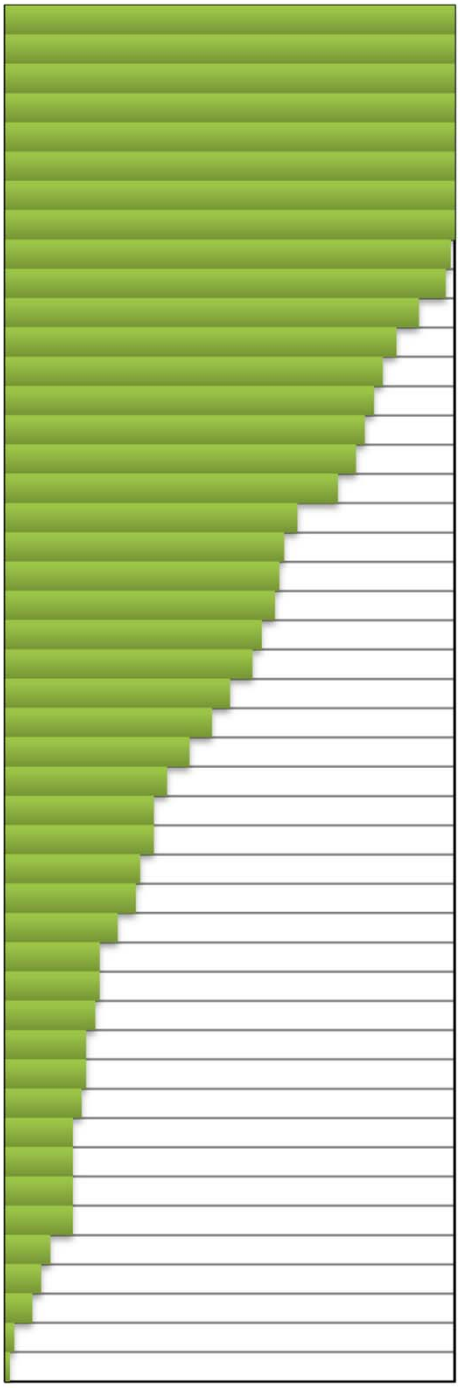
[1]Not all mineral commodities covered in this publication are listed here. Those not shown include mineral commodities for which the United States is a net exporter (abrasives, metallic; boron; clays; diatomite; gold; helium; iron and steel scrap; iron ore; kyanite; molybdenum concentrates; sand and gravel, industrial; selenium; soda ash; titanium dioxide pigment, wollastonite; zeolites; and zirconium) or less than 24% import reliant (beryllium; cement; diamond, industrial stones; feldspar; gypsum; iron and steel slag; lime; nitrogen (fixed)-ammonia; phosphate rock; sand and gravel, construction; stone, crushed; sulfur, and talc and pyrophyllite). For some mineral commodities (hafnium; mercury; quartz crystal, industrial; and thallium), not enough information is available to calculate the exact percentage of import reliance.

[2]In descending order of import share.
[3]Data include lanthanides

Data from U.S. Geological Survey, 2019, Mineral commodity summaries 2019: U.S. Geological Survey, 200 p., https://doi.org/10.3133/70202434, Page 6.

1995 U.S. NET IMPORT RELIANCE FOR SELECTED NONFUEL MINERAL MATERIALS

ARSENIC	100	China, Chile, Mexico
COLUMBIUM (niobium)	100	Brazil, Canada, Germany
GRAPHITE	100	Mexico, Canada, China, Madagascar
MANGANESE	100	South Africa, gabon, France, Brazil
MICA, sheet (natural)	100	India, Brazil, Finland, China
STRONTIUM (celestite)	100	Mexico, Germany
THALLIUM	100	Belgium, Canada, United Kingdom
YTTRIUM	100	China, United Kingdom, Hong Kong, Japan, France
BAUXITE & ALUMINA	99	Australia, Jamaica, Guinea, Brazil
GEMSTONES	98	Israel, India, Belgium, United Kingdom
FLUORSPAR	92	China, South Africa, Mexico
TUNGSTEN	87	China, Germany, Bolivia, Peru
TIN	84	Brazil, Bolivia, Indonesia, China
COBALT	82	Zambia, Norway, Canada, Zaire, Finland
TANTALUM	80	Australia, Germany, Canada, Thailand
CHROMIUM	78	South Africa, Turkey, Zimbabwe, Russia, Finland
POTASH	74	Canada, Belarus, Germany, Israel, Russia
BARITE	65	China, India, Mexico
IODINE	62	Japan, Chile
NICKEL	61	Canada, Norway, Australia, Dominican Republic
ANTIMONY	60	China, Mexico, South Africa, Hong Kong
STONE (dimension)	57	Italy, Spain, India, Canada
PEAT	55	Canada
MAGNESIUM COMPOUNDS	50	China, Canada, Mexico, Greece, Austria
ASBESTOS	46	Canada
ZINC	41	Canada, Mexico, Peru, Spain
DIAMOND (dust, grit & powder)	36	Ireland, China, Russia
SELENIUM	33	Canada, Philippines, Japan, Belgium, United Kingdom
SILICON	33	Norway, Brazil, Canada, Russia
GYPSUM	30	Canada, Mexico, Spain
PUMICE	29	Greece, Zaire, Turkey, Ecuador
ALUMINUM	25	Canada, Russia, Venezuela, Brazil
CADMIUM	21	Canada, Mexico, Belgium, Germany
IRON & STEEL	21	European Union, Canada, Japan, Brazil, South Korea
NITROGEN (fixed), AMMONIA	20	Trinidad & Tobago, Canada, Former Soviet Union, Mexico
IRON ORE	18	Canada, Brazil, Venezuela, Australia, Mauritania
SULFUR	18	Canada, Mexico
CEMENT	17	Canada, Spain, Greece, Venezuela, Mexico
LEAD	15	Canada, Mexico, Peru, Australia
SALT	15	Canada, Mexico, Bahamas, Chile
SODIUM SULFATE	15	Canada, Mexico
VERMICULITE	15	South Africa
MICA, scrap & flake (natural)	10	Canada, India
PERLITE	8	Greece
COPPER	6	Canada, Chile, Mexico
RARE EARTHS	2	Australia
LIME	1	Canada, Mexico



Additional commodities for which there is some import dependency include:

Bismuth	Mexico, Belgium, China, Peru
Gallium	France, Germany, Russia, United Kingdom, Hungary
Ilmenite	South Africa, Australia, Canada
Indium	Canada, France, Italy, Belgium, Russia
Iron & steel slag	Canada, Japan
Kyanite	South Africa, France
Mercury	Canada, Russia, Germany
Platinum	South Africa, United Kingdom, Belgium, Germany
Rhenium	Chile, Germany, United Kingdom, Russia, Kazakstan
Rutile	Australia, Sierra Leone, South Africa
Silver	Mexico, Canada, Peru, Chile
Thorium	Australia
Titanium (sponge)	Russia, Japan, China
Vanadium	Russia, South Africa, Canada, Mexico
Zirconium	Australia, South Africa

Data from U.S. Geological Survey, 1996, Mineral commodity summaries 1995: https://minerals.usgs.gov/minerals/pubs/mcs/1996/nir.gif