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The Mining Boom is Coming, but Where Can Their Workers Live?

By Caitlin McKennie
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Introduction

Building out a robust talent pipeline for the mining sector through providing quality jobs to workers and advancement opportunities (i.e., training, upskilling, and next skilling efforts) will be a central factor for ramping up domestic critical mineral production and strengthening U.S. energy security. Yet, the labor force associated with nonfuel mineral mining in the U.S. has remained roughly stagnate over the last five years (with an average workforce of 140,000 nationally). This aligns with new statistics coming from employers. Currently, 71% of mining companies are reporting experiencing a talent squeeze that is essentially road blocking production targets and strategic goals, with 86% of executives saying it is harder to attract and retain talent now relative to two years ago.[1]

Compounding this already tight labor market, analytics from a McKinsey study report major drops in the level of young talent joining the industry – a trend driven largely by the changing nature of work and employee preferences surrounding overall workplace experience. Table 1 showcases this impact and reflects a 39% decrease in U.S. attainment levels associated with mining completions between 2016 and 2020.

[1] McKinsey & Company. *"Has mining lost its luster? Why talent is moving elsewhere and how to bring them back." February* 14, 2023. Retrieved at: https://www.mckinsey.com/industries/metals-and-mining/our-insights/has-mining-lost-its-luster-why-talent-is-moving-elsewhere-and-how-to-bring-them-back

Mining Engineering Graduates in the U.S.,

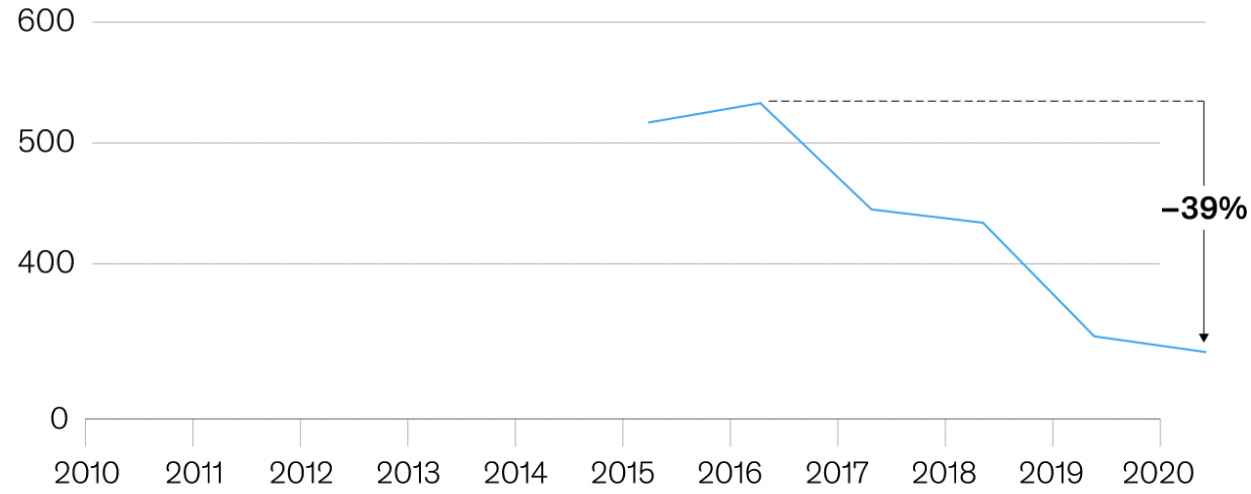

Table 1- Minerals Tertiary Education Council mining engineering university 4th-year enrollment.
Mining engineering university graduates.
Sourced from: https://www.mckinsey.com/industries/metals-and-mining/our-insights/has-mining-lost-its-luster-why-talent-is-moving-elsewhere-and-how-to-bring-them-back
Source: McKinsey & Company. *"Has mining lost its luster? Why talent is moving elsewhere and how to bring them back." February* 14, 2023. Retrieved at: https://www.mckinsey.com/industries/metals-and-mining/our-insights/has-mining-lost-its-luster-why-talent-is-moving-elsewhere-and-how-to-bring-them-back

If mining areas want to keep up with projected demand for critical mineral output and ease the tension of global energy uncertainty, the shortages linked talent acquisition needs to change – and rapidly. In short, employers are going to have to retranslate how they attract and retain talent in the field.

This paper explores the skills shortage in the U.S. mining sector and considers ways in which employers can bolster employment levels through systematic changes that strengthen workforce conditions. While big shifts in the clean energy workforce will hinge on how quickly career advancement opportunities can be provided to job seekers, we can estimate changes in talent supply based on three transparent measurements that appeal to job seekers. These estimates surround growth projections over the next decade, annual expected job openings, and earning levels capable of providing a livable wage. Together, they translate into jobs that are in high demand with strong potential to grow in upcoming years and pay wages that, at a minimum, cover the cost of living in a particular area. The gap between hires versus openings will depend on how employers respond to providing their workers with jobs that meet this short criteria list.

Earning A Livable Wage in the Mining Sector

Average wages linked to critical mineral production workers shot up to $1,200 per week last year, increasing by 15.6 percentage points from 2018 levels. This adds up to a national average of $62,400 in annual earnings. While this boost is associated with a positive change, mining needs higher rewards to attract and retain forecasted job growth. As it stands currently, mining earnings don't stretch far enough to afford life's necessary expenses. It's important to note here that it's well known that a livable wage (or a "*survival wage*") varies significantly based on the cost of living associated with a particular U.S. state or metropolitan area, but on an aggregate level, earnings in this sector just aren't enough to cover basic needs.

The top and bottom sections of Table 2 report the highest and lowest living wage thresholds for the first quarter of 2023 in the U.S., assuming a family of three (with two adults – one who is working – and one child). The average salary for critical mineral production workers falls short of the bottom lowest living wage areas by a gap of $1,040 – spotlighting dire need for improvement in earnings for these linked occupations.

The middle section of Table 2 reports the minimum living wage floor threshold for popular mining areas in the U.S. (e.g., areas where top U.S. based mining companies are headquartered). Based on USGS national wage estimates associated with the critical mineral job force, eligible workers would be unable to afford the cost of living in any of these metropolitan regions, making it extremely difficult to attract and retain talent to these areas.[2]

2023 Minimum Living Wage Floor Thresholds by MSA, Including Popular Mining Areas in the U.S.

	Rank	Metropolitan Area	State	Region	Minimum Hourly Living Wage Floor Threshold (Pre-Tax Family Income)	Minimum Annual Living Wage Floor Threshold (Pre-Tax Family Income)
Bottom 5 Lowest Living Wages	1	McAllen-Edinburg-Mission	Texas	South	$30.50	$63,440.00
	2	El Paso	Texas	South	$30.68	$63,814.40
	3	Greenville-Anderson-Mauldin	South Carolina	South	$31.01	$64,500.80
	4	Chattanooga	Tennessee	South	$30.55	$63,544.00
	5	Columbia	South Carolina	South	$31.23	$64,958.40
Living Wages for Top Mining U.S. Areas	1	Riverside-San Bernardino-Ontario	California	West	$36.53	$75,982.40
	2	Phoenix-Mesa-Scottsdale	Arizona	West	$35.70	$74,256.00
	3	Las Vegas-Henderson-Paradis	Nevada	West	$33.78	$70,262.40
	4	Charlotte-Concord-Gastonia	North Carolina	South	$33.96	$70,636.80
	5	Denver-Aurora-Lakewood	Colorado	West	$38.16	$79,372.80
Top 5 Highest Living Wages	1	San Diego-Carlsbad	California	West	$41.69	$86,715.20
	2	New York-Newark-Jersey City	New York	North	$39.44	$82,035.20
	3	Boston-Cambridge-Newton	Massachusetts	North	$40.39	$84,011.20
	4	San Francisco-Oakland-Hayward	California	West	$44.63	$92,830.40
	5	San Jose-Sunnyvale-Santa Clara	California	West	$45.95	$95,576.00

Table 2 – Living Wage Threshold Data for a Family of Three (2 adults – one working – one child), before taxes, sourced from: https://livingwage.mit.edu/articles/103-new-data-posted-2023-living-wage-calculator
Data on common mining areas in the U.S. sourced from: https://miningdigital.com/top10/top-10-us-based-mining-companies

Labor Market Demand Linked to Critical Mineral Value Chains

It's safe to say labor market demand for domestic production of critical minerals will reflect high-need/high-demand jobs. If wages can catch up with inflation levels and surpass cost of living estimates by region, these opportunities can be considered "top jobs" – i.e., occupations able to attract and retain talent in critical fields. This will be especially true if employers provide job seekers with clear pathways for career advancement within the field while enhancing overall workplace culture.

[2] U.S. Department of the Interior. 2023.
U.S. Geological Survey. *Mineral Commodities Summary*. 2023. Retrieved at: https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf

At an aggregate level, expectations surrounding the U.S. mining sector as a whole are robust. The most recent forecasts indicate the industry will experience the fastest output growth among all good-producing sectors in the country, reflecting an annual growth rate of 2.2% between now and 2031.[3] This is associated with an additional 63,800 jobs seeking talent across the U.S. during this timeframe. We can assume critical mineral extraction is the central driver bolstering positive projections here, given the significant actions taken by government entities over the last year to enhance America's critical mineral value chains, as identified in Executive Order 14017.

2022 Legislation Relating to Workforce Development for Critical Minerals

A motivated and trained domestic workforce is the core key component of a robust critical mineral value chain. Recent policy implementation over the past year acknowledges the importance of this as well. Table 3 reports U.S. legislation passed in 2022 to support the build out of critical mineral supply chains and its associated workforce.[4]

Recent Legislation Passed to Accommodate Labor Squeeze in the Mining Workforce

Legislation Title	Month Signed	Allocation Amount	Expected Economic/Workforce Outcomes linked to Critical Minerals
Ukraine Supplemental Appropriations Act	May 2022	$600 million	Feasibility studies, byproduct and coproduct extraction, modernization, and productivity improvements, recycling, and reclamation, and industrial resources.
CHIPS and Science Act	August 2022	$280 billion	Enhance domestic capability in several areas: reduce the likelihood that shocks abroad might disrupt the supply of semiconductor chips; create domestic jobs; improve international competitiveness; and ensure a secure supply of semiconductors to limit manufacturing vulnerabilities.
Inflation Reduction Act	August 2022	$391 billion	Specifically related to critical minerals, it authorized $391 billion in funding for climate change and domestic energy production. The legislation included targeted tax incentives aimed at manufacturing U.S.-sourced materials such as batteries, electric vehicles, solar, and wind parts and technologies like carbon capture systems.
National Defense Authorization Act	December 2022	$858 billion	Includes a provision requiring a federal strategy be developed to recycle and recover critical minerals from batteries used in the Federal electric vehicle fleet.

Table 3 - Supply Chain Security and U.S. Critical Minerals Initiatives for Workforce Expansion Implemented in 2022, Source: USGS Critical Minerals 2023 Report

Conclusion

Investments in domestic production and job creation couldn't have come at a better time, as the worry of dependence on foreign mineral supply has snowballed while the U.S. helplessly watched the rippling impacts across the E.U. spurred by Russia's invasion of the Ukraine earlier this year. Right now, America finds itself in potentially a similar predicament (history does tend to repeat itself), as over the course of the previous 12 months, the U.S. was 100% net import reliant for 12 of the 50 critical minerals defined by the USGS.

In the shorter term, recently passed legislative acts will help in supplying the talent needed to bring big shifts in domestic critical mineral processing and production, but to retain the workforce needed to build U.S. energy security for the long-term, *job quality* will also be a major topic at the front of labor market discussions.

[3] This projection excludes agriculture from good-producing sectors.
[4] Source utilized: https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf

This component will fall on the shoulders of employers and will be compounded by an aging population and foreign competition for U.S. talent.

In recent months, there's been a clear consensus across green energy representatives that certain parts of the world currently strategizing robust labor market plans that work will be remembered throughout history as the winners of the global energy transition. In retrospect, those lacking feasible approaches that strengthen the mining workforce and build out domestic value chains associated with critical mineral production will likely be earmarked in history as the losers who couldn't catch up to the trailblazers.

ABOUT THE AUTHOR

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Caitlin recently completed her PhD in Economics from the University of Stirling and is a postdoctoral fellow at the Payne Institute. Prior to her doctorate, she received an M.A. in applied economics from the University of Colorado, Denver, and an M.S. in mineral and energy economics from Colorado School of Mines. Caitlin comes to Payne after five years of working for the State of Colorado in numerous roles, across several agencies and executive leadership teams. She brings extensive experience in public policy and economics to this position in a manner that is outcome-focused and quantitatively driven. Her empirical research at Payne focuses largely on sustainability, energy consumption, and mineral markets at state, national, and global levels. While a research fellow at the Payne Institute, she intends to apply her unique skillset and curious mindset towards helping the world become a more equitable, viable, and environmentally sustainable place to live – one of which never loses its intrinsic value.

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