

Shifts in the Energy Workforce

By Caitlin McKennie, Morgan D. Bazilian and Brad Handler

The recent passage of the Inflation Reduction Act heralds an unprecedented era of climate investment for the U.S. Such investment brings with it the promise of new jobs across the clean energy landscape. For rural communities that have historically depended on fossil fuel development or use, however, included several in Colorado, the outlook is at least more complicated. Nearer term, commitments in CO to close down coal plants threaten a number of jobs in specific communities. And longer term, the weaning off of oil use points to declines in employment in that sector as well. The good news for many of these communities is that clean energy presents opportunities to help diversify their economies with good paying jobs, including development of critical minerals given our state's endowment in these natural resources. But it will be incumbent on these communities and the state, including CO's Office of Just Transition, to retrain workers and, more generally, to foster this transition.

THE RISK TO FOSSIL FUEL JOBS

This year, four of the seven operating coal-fired electrical power generating plants have been approved for closure dates by the [Colorado Public Utilities Commission \(PUC\)](#) and scheduled to cease operations between 2023 and 2030. These closures are located in Moffat, El Paso, and Larimer counties, all of which are considered rural areas of the state. Halts in plant operations pose a risk of displacing more than [25%](#) (519 out of the 1,914) of the energy workers in Colorado currently employed at coal production plants. It's estimated that another 1,000 jobs across the 11 coal reliant counties could also be adversely affected/experience job loss.

In the longer term, as the energy transition speeds up, those employed by oil and gas are likely to be the next mark. In terms of impact magnitude for the state, oil and gas sectors employ over [33,000 workers](#) in Colorado. The majority of these jobs are ones that have largely remained in high demand and earn high wages. Mining, Quarrying, and Oil and Gas Extraction occupations are responsible for making up one of the top 20 paying industries in the state in addition to bolstering an average per worker wage increase of 51.82% between 2001 and 2021.

So, while the energy transition is creating many new opportunities, it also threatens major job loss, reductions in local tax revenues, and challenges rural communities to reinvigorate – or even reinvent – themselves to thrive economically. Worker training efforts and adequate, quality opportunities for skill assessment and advancement will be a critical component assisting individuals in securing and succeeding at new jobs. This is especially pertinent as transportation needs shift away from the use of oil and recent [forecasts](#) expect oil demand to see a secular decline between now and 2050.

CLEAN ENERGY OPPORTUNITIES

On the opposite side of the energy spectrum, Colorado has a large number of mineral deposits capable to produce renewable energy. According to the 2020 [Mineral Commodity Summary Report](#), the state is estimated to be endowed with nonfuel minerals valued at upwards of \$2 billion in annual production revenue – ranking 17th in the U.S. in terms of profitable nonfuel mineral extraction. In relation to this labor market, Colorado’s mining industry currently accounts for a workforce estimated at 21,595 and is projected to grow by 22.2% between now and 2030, increasing by 4,793 additional jobs.¹ This carries an annual average percentage change of 2.02% growth each year, despite the transitional efforts taking place for coal miners. This is a key indicator that Colorado’s demand for critical minerals will continue to thrive and transferable skills across energy workers will be a valuable leverage in order to keep individuals in this labor market and local supply chains at their optimal capacity.

Copper, a standout electrical conductor and the critical mineral needed for many clean energy technologies – including solar PV, wind, bioenergy, EVs and battery storage – is a top resource that will likely prove valuable to the global energy transition as well as the state’s workforce moving forward. [Metallic Minerals](#), a growth stage exploration company based out of Vancouver, B.C. has estimated a total of [985 million pounds of copper equivalent](#) in the Allard deposit located in the southwestern part of Colorado. Considering the Inflation Reduction Act includes [incentives for US mining companies](#) to bolster domestic supply chains for climate tech, production efforts related to this endowment are likely to gain momentum alongside the rollout of renewables that require copper. As the nation transitions away from fossil fuels towards a more [mineral-intensive energy system](#), Colorado can expect a lasting impact on employment opportunities in the clean energy sector.

CO’S JUST TRANSITION EFFORTS

Despite the long-time cyclical boom-and-bust history of the state’s economy, Colorado was one of the first states to undertake just transition initiatives through the creation of the [Office of Just Transition \(OJT\)](#) with the purpose to assist workers and communities as they transition away from fossil fuels as an economic driver. The OJT plans to mitigate negative impacts in the state through job creation (specifically, jobs capable of sustaining a family in Colorado), prioritizing a broader property tax base, and driving economic diversity efforts. If successful, this will allow rural communities to maintain a thriving economy as well as a skilled and capable labor force. With new funding allocations from [House Bill 21-1290](#), the OJT plans to invest in economic development plans unique to a particular community while providing relevant/credible training opportunities that qualifies individuals to obtain good jobs.

¹ Office of Labor Market Information, Colorado Department of Labor and Employment

To mitigate unemployment spikes and local economic downturns, the State of Colorado submitted the [Colorado Just Transition Action Plan](#). Items outlined within the report largely surround investments in local economic development leading to job/business growth, deployment of a workforce roadmap and toolkit that includes career coaching and job training for displaced workers, and creation of a “task force” in each transition community to lead and support efforts. [Previous literature](#) from the [Payne Institute for Public Policy](#) recommends fostering similar strategies for successful transition outcomes.

With rural prosperity being a current point of contention across U.S. policy makers while labor shortages remain a barrier for talent needs in the economy, job growth in new sectors – some that strategically utilize transferable skills – will be a pivotal force in determining how we quickly we succeed in make the grade in relation to the global energy transition. Just Transition efforts can help through channels that accelerate green energy while benefiting the worker. Other states can take note from Colorado’s OJT strivings to retain talent along the western slope through workforce training associated with mineral extraction.

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ABOUT THE AUTHORS

Caitlin McKennie

Payne Institute Research Associate – Critical Minerals

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.

Brad Handler

Payne Institute Program Manager, Sustainable Finance Lab, and Researcher

Brad Handler is a researcher and heads the Payne Institute's Sustainable Finance Lab. He is also the Principal and Founder of Energy Transition Research LLC. He has recently had articles published in the Financial Times, Washington Post, Nasdaq.com, Petroleum Economist, Transition Economist, WorldOil, POWER Magazine, The Conversation and The Hill. Brad is a former Wall Street Equity Research Analyst with 20 years' experience covering the Oilfield Services & Drilling (OFS) sector at firms including Jefferies and Credit Suisse. He has an M.B.A from the Kellogg School of Management at Northwestern University and a B.A. in Economics from Johns Hopkins University.

Morgan Bazilian

Director, Payne Institute and Professor of Public Policy

Morgan Bazilian is the Director of the Payne Institute and a Professor of public policy at the Colorado School of Mines. Previously, he was lead energy specialist at the World Bank. He has over two decades of experience in the energy sector and is regarded as a leading expert in international affairs, policy and investment. He is a Member of the Council on Foreign Relations.

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