Matching Geographies and Job Skills in the Energy Transition

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A new paper from scholars at Oxford University and Resources for the Future finds that, on average, fossil-fuel jobs require different skill sets than the high-paying jobs that are expected to grow in the coming decade—an indication that localized workforce development efforts are needed to support fossil-fuel workers in the years ahead.

Driven by technological innovation, public policy, and other factors, the US energy system is facing rapid changes, raising concerns over potential job losses, particularly among workers in coal, oil, and natural gas. Because there will be considerable variation across the United States in the labor market impacts of a changing energy landscape, workforce development policies must be tailored to local contexts.

Numerous analyses have identified guiding principles to enable an equitable energy transition, and several studies have estimated that a transition to cleaner energy in the United States would lead to a net increase in jobs. However, these analyses generally do not take into account the need for fossil fuel workers to develop new skills that can enable them to find new employment in similar-paying fields.

Key Findings

Although there are considerable differences across regions, two common themes emerge. First, fossil fuel workers meet or exceed the technical skills levels (e.g., operations monitoring, equipment maintenance) associated with in-demand occupations in every commuting zone. Second, these workers fall short in most other skill categories for in-demand occupations where average salaries meet or exceed 90 percent of fossil fuel salaries. The largest gaps are found in areas that the O*NET data we rely upon characterizes as “complex problem solving,” “systems,” and “process” skills, which are detailed in our full analysis.

Nationally, fossil fuel jobs account for less than one percent of the US total. However, these jobs account for 10 to 20 percent of jobs in some regions, particularly parts of the Intermountain West, Appalachia, Texas, and the Gulf Coast. Commuting zones with the highest dependence on fossil fuel jobs tend to display larger skill gaps than commuting zones with lower dependence, suggesting the need for robust economic and workforce development efforts in locations with the highest concentrations of fossil fuel jobs.

The figure on the next page describes this dynamic through a series of radar plots that show this gap for each of the seven skill types in commuting zones that broadly represent the parts of the United States that are most vulnerable to a transition away from fossil fuels.

Objective

Our analysis is the first to quantify the scale of the “skills gap” that fossil fuel workers may face when seeking new employment opportunities with similar pay in their local labor markets. Using data and projections from the US Census, Bureau of Labor Statistics, W.E. Upjohn Institute, and the Occupational Information Network (O*NET), we:

- Assess the share of fossil fuel jobs at risk in every US commuting zone under a scenario that reduces global greenhouse gas emissions to net zero by 2050;
- Quantify the skillsets of the fossil fuel workforce in each commuting zone using 35 discrete skills;
- Quantify “in-demand” skillsets needed to work in sectors that are projected to grow most quickly and that pay 90 percent or more of fossil fuel wages in each commuting zone;
- Measure the extent of the match between these in-demand skills and those attained by fossil fuel workers.
Policy Implications

This information should be seen as one input into a complex decision-making process when determining which workforce development interventions are likely to be most successful in fossil energy communities facing economic changes. It will need to be coupled with an understanding of other factors such as the types of jobs that fossil fuel workers want to seek out, local retraining providers and additional region-specific information. Future research and engagement can help provide this information to further inform locally tailored workforce and economic development policy.

For more information, read the full working paper here.