



The Key to the Energy Transition

Reskilling & Upskilling from Fossil Fuels
to Renewables

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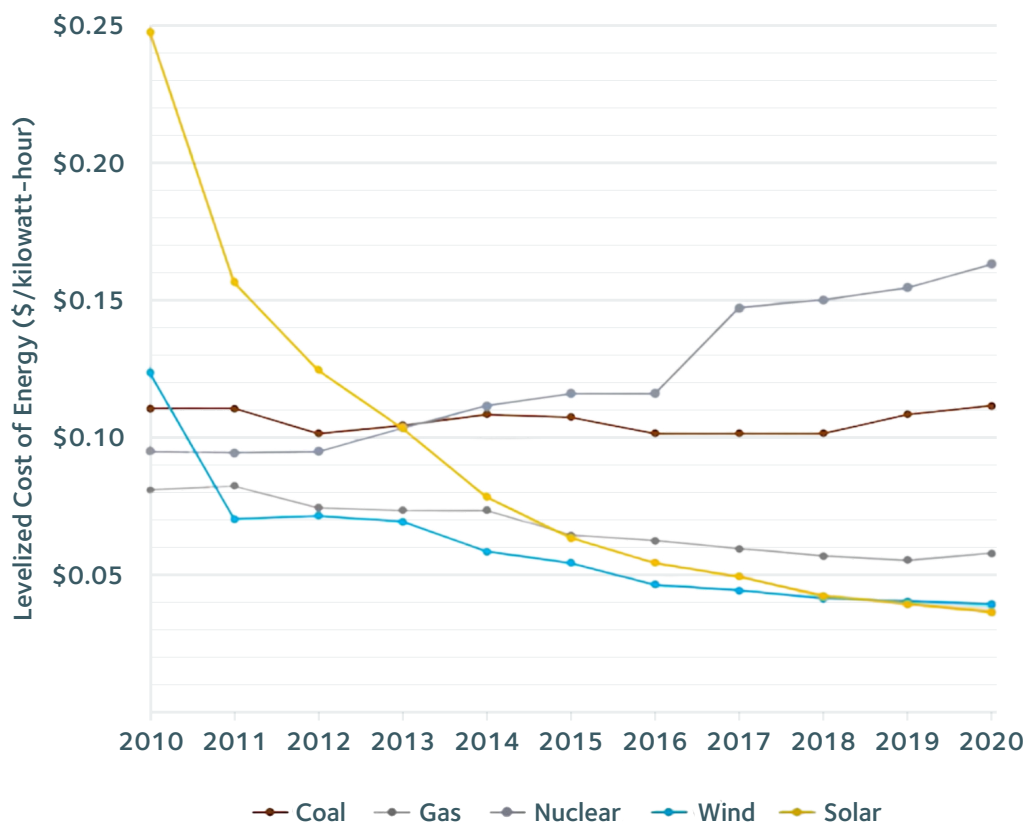
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The Oil and Coal industries are hemorrhaging jobs, while the Solar and Wind Energy industries are growing at breakneck speed. Can workers make the switch?

The energy industry is undergoing a historic change. The price of renewable energy has been plummeting exponentially for the past decade due to new technologies, economies of scale and supply chain improvements. The cost of electricity from utility scale solar photovoltaics fell 85 per cent between 2010 and 2020ⁱ. Production of renewable energy surpassed coal production in the US for the first time in 2021ⁱⁱ. It is expected that by 2025, 85 per cent of US coal plants will be more expensive to run than building a wind or solar energy plant within 35 milesⁱⁱⁱ. As unrest in Eastern Europe drives up the price of oil, investment in alternative energy sources is likely to accelerate.

Figure 1: Levelized Cost of Electricity by Source, US



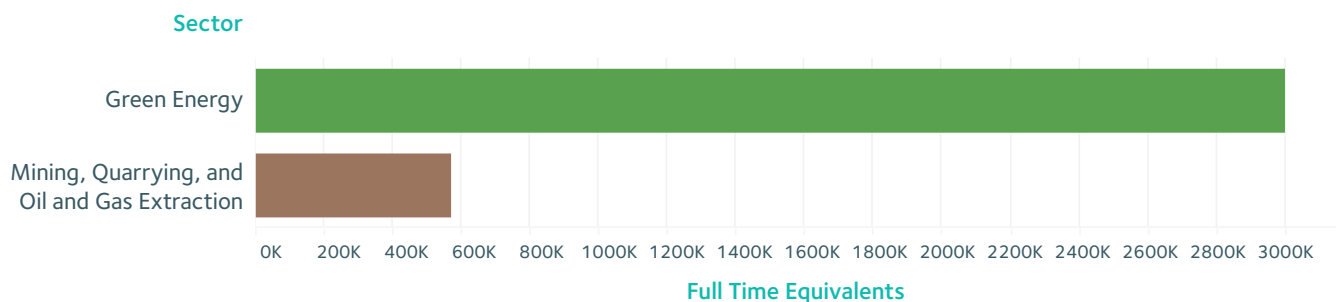
Source: RethinkX^{iv}

Green jobs booming while brown jobs in rapid decline

The falling cost of renewable energy has led to a corresponding rise in employment in the sector.

There are currently over three million Americans working in the Clean Energy sector^v, while the Oil and Coal industries have been losing workers for the past decade. Between 2009 and 2017, employment in the coal industry dropped by 58 per cent from 86,000 to 50,000 workers^{vi}. Across the Mining, Quarrying, and Oil and Gas Extraction industry, there are a total of only 570,000 workers.

Figure 2: US Energy Industry Employment Levels, 2022

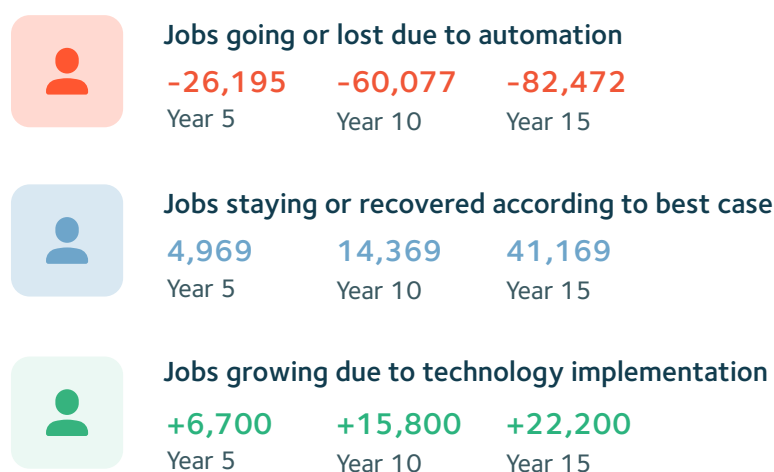


As the Texan energy workforce is increasingly displaced by automation, urgency grows for reskilling and redeployment at scale

Texas is the leading producer of energy in the country^{vii}. The state produces 43 per cent of the nation's crude oil and 28 per cent of its wind power. Overall, it produces twice as much power as Florida, the next largest energy producer. The industry employs over 200,000 Texans.

Like most industries, the Oil and Gas Industry in Texas experienced serious consequences from the COVID-19 crisis. Analysis through Faethm's Economic Scenario Module^{viii} indicates that, even in the best-case scenario, the industry is likely to lose more workers to automating technologies in the next five years than it will gain through economic recovery.

Figure 3: Mining, Quarrying, and Oil and Gas Extraction Jobs in Texas Going, Recovering, Growing



Over the next 15 years, the industry will have a gap of more than **60,000 displaced workers** due to automating technologies



In the most optimistic scenario, the Mining, Oil and Gas Industry will regain 40,000 workers over the next 15 years as the economy recovers from COVID-19. However, Faethm analysis indicates that in the next five years, 26,000 jobs will be lost due to the implementation of new technologies.

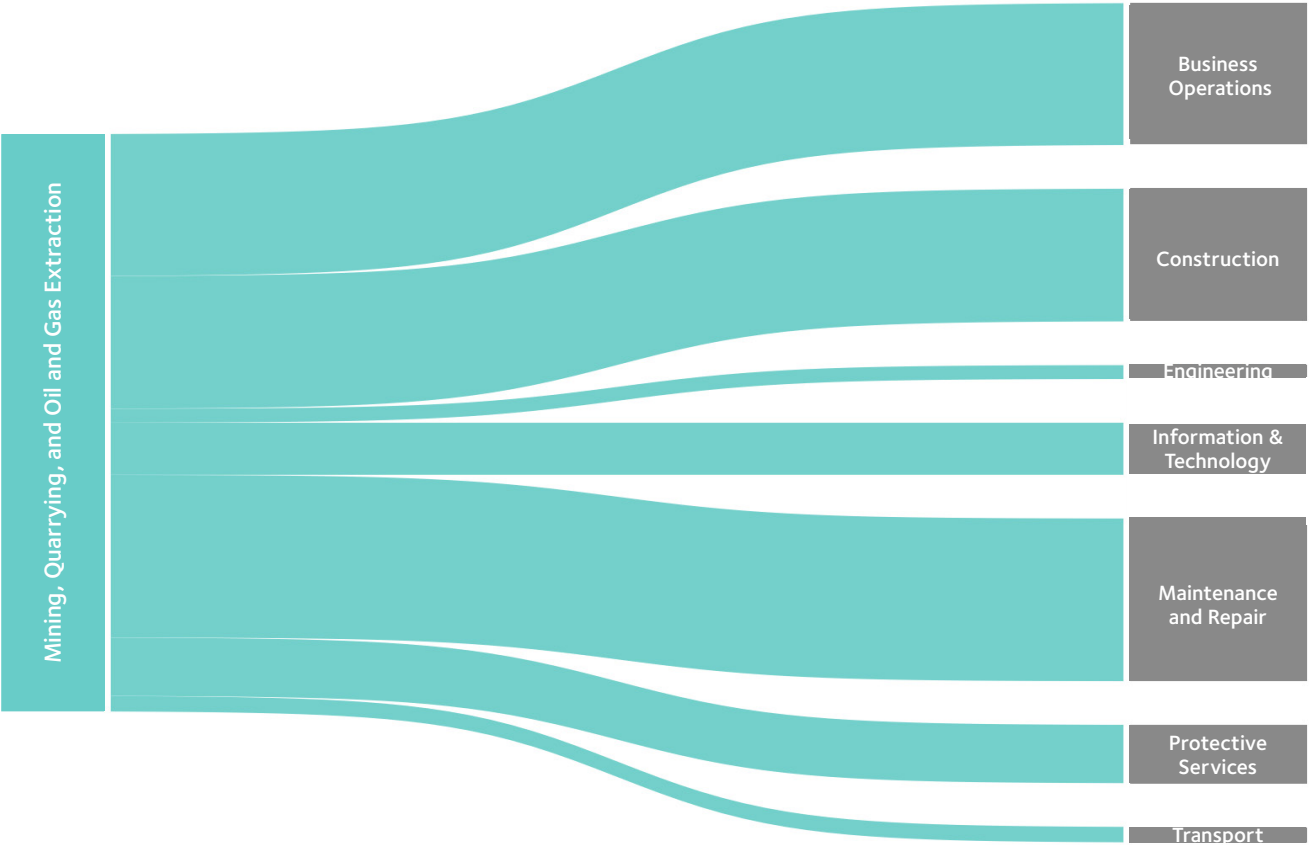
It will be imperative to transition these workers into other industries, including the expanding Green Energy sector. This can be done through education and reskilling. Analysis conducted using Faethm’s Occupation Ontology shows that skill utilization across the two industries is very similar. This suggests that workers in the Oil and Coal Industries should be able to make the transition to Green energy jobs with minimal effort.

Figure 4: Skill Levels Across Energy Industries in Texas



Additionally, Faethm’s job corridor was used to analyze potential job transitions from the most populous roles in the Mining, Oil and Gas Industry into other industries beyond the energy sector. These are opportunities that could be acquired with minimal upskilling and education.

Figure 5: Potential Career Paths for Top Jobs in the Texan Oil and Gas Industry



The transition to renewables will be far from seamless

Moving workers from the Oil and Coal industries into roles in the Green Energy sector will take a concerted effort from employers, governments, and educational institutions. However, the benefits of such a transition far outweigh the difficulties.

Green energy jobs offer wages higher than the national average and many are available without a college degree, to say nothing of the impact on the environment. With forethought and planning, the rise of Green energy can be a boon to workers across the country.

With proper planning, these transitions can be made with minimal disruption to workers' lives. Many states are utilizing existing infrastructure at closed oil and coal energy plants for new clean energy projects. In Virginia, Washington, Massachusetts and Illinois, closed coal mines and energy plants are being converted into solar farms and solar-plus-storage facilities. This means that the new jobs that come with these facilities will be right in the communities where coal jobs are disappearing.



Reskilling, upskilling, and planning will fuel the final push to greener pastures

Regardless of one's position within the energy industry, the world of work is changing. Workers in every industry will have to be prepared for changes brought on by new technologies that will automate or augment all aspects of work. As some jobs are replaced entirely by machines, workers will need to be reskilled to take up new positions. Other workers will need to be upskilled to keep pace with the advancement of technology as it transforms existing roles.

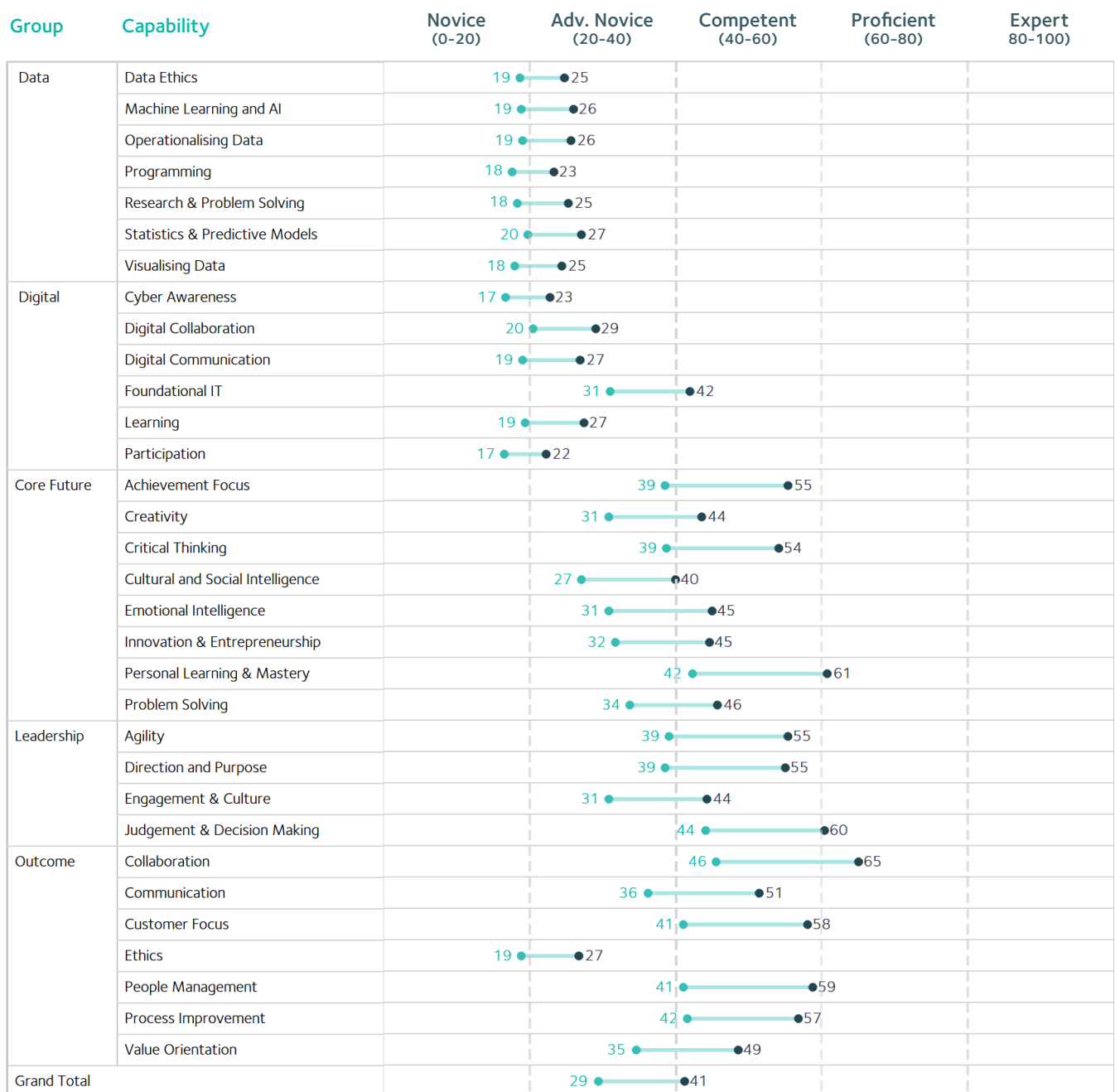
Faethm's Future Capability Module was developed to help employers analyze key areas for upskilling within their organizations. It focuses on 32 capabilities which will be essential for success as technology replaces and transforms human work. Below is an overview of how workers on both sides of the energy industry will need to be upskilled in order to remain competitive and employable in the job market of the future.



Figure 6: Capability Levels in the Mining, Quarrying, and Oil and Gas Extraction Industry

Capability maturity today and where it needs to be by 2027

Year ● 2022 ● 2027



While workers in the Mining, Quarrying, and Oil and Gas Extraction Industry will have to be reskilled in order to fill roles in the Green Energy Industry, workers in the Green Energy Industry will also require upskilling in order to adapt to new technologies. As machines take over increasingly technical tasks, capabilities like Leadership, Achievement Focus, and Personal Learning and Mastery will become especially crucial.

As figure 7 shows, in the next five years, workers in the Green Energy Industry will require a proficient level of competence in 17 of 32 capabilities. Workers in the Mining, Quarrying, and Oil and Gas Extraction Industry will need a proficient level only in three fields: Collaboration, Personal Learning & Mastery and Judgement & Decision Making.

There is important work to be done to move workers out of vanishing jobs in the Coal, Oil and Gas Industries and into jobs in the growing Green Energy sector. It is equally important to ensure that, once there, workers are prepared for transformations brought about by new technologies. Education, upskilling, and reskilling will be crucial for everyone in the workforce of the future.



Figure 7: Capability Levels in the Green Energy Industry



In summary

While the Oil and Coal industries are facing serious downturns, the workers in those industries don't have to. Opportunities exist to transition into the growing Green Energy industry, as well as into other industries.

There are some actions that educational institutions, private enterprises, and governments can take right away:

- **Educational institutions** can start preparing new graduates for green energy jobs by focusing on the skills and knowledge that will be vital to the industry.
- **State governments** can incentivize green energy job growth. In 2019, Illinois passed legislation to convert unused coal power plants into solar-plus-storage facilities. Initiatives like this could make energy transition economically viable.
- **Investment into the Green Energy sector** is growing and will continue to drive change and supercharge this industry's expansion. Energy transition mechanisms (ETMs) are an emerging financial instrument being deployed around the globe to enable nations to retire their coal and oil assets early. For organizations and state governments to capitalize on this sizable and timely opportunity they will need to collaborate closely to attract the significant investments available to enable this transition.

The transition to a greener economy leads to positive impacts that extend to the wider society, boosting an economic recovery post-COVID-19 and strengthening economic competitiveness. With education and upskilling, the green energy revolution can deliver enormous benefits to workers leaving brown energy jobs for secure, well-paid work which is also much less at risk of automation.



References

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- ⁱⁱⁱ Marcacci, Silvio “The Coal Cost Crossover: 74% Of US Coal Plants Now More Expensive Than New Renewables, 86% By 2025” Forbes <https://www.forbes.com/sites/energyinnovation/2019/03/26/the-coal-cost-crossover-74-of-us-coal-plants-now-more-expensive-than-new-renewables-86-by-2025/?sh=7c95105822d9>
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- ^v “Clean Jobs America, 2021” Environmental Entrepreneurs <https://e2.org/reports/clean-jobs-america-2021/>
- ^{vi} Marcacci, Silvio “Renewable Energy Job Boom Creates Economic Opportunity As Coal Industry Slumps” Forbes <https://www.forbes.com/sites/energyinnovation/2019/04/22/renewable-energy-job-boom-creating-economic-opportunity-as-coal-industry-slumps/?sh=2f0f9c833665>
- ^{vii} “Texas State Energy Profile” US Energy Information Administration <https://www.eia.gov/state/print.php?sid=TX>
- ^{viii} ESM quantifies the shape of your workforce today and into the future based on the impact of emerging technologies, economic scenarios and government policies. To achieve this, ESM leverages Faethm’s unique IP; our technology model that identifies and applies the impact of automation and augmentation technologies across the workforce.



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