Manpower Report: Power Industry Faces Talent Shortage

05/05/2014 | Aaron Larson

A report released on May 5 by staffing firm Manpower suggests that utilities are under a "double squeeze"—a shortage of skilled workers at both the entry and senior level—caused by an aging workforce, advances in technology, and a breakdown in the educational system.

In its report, "Strategies to Fuel the Energy Workforce (https://docs.google.com/file/d/0By8DaUoNvkIzQ1F2TEpZWHJJYWM/edit)," Manpower noted that 58% of the energy executives the company polled for its energy workforce survey said they struggle to find the talent they need and 74% believe the problem will worsen over the next five years. Job categories identified as being in greatest demand included field workers, skilled trades, and highly educated professionals.

The talent shortage may already be slowing growth and expansion. By some estimates, there will be 3 million energy sector jobs by 2020. In the utilities subsector—where half of the workforce is already over the age of 40—100,000 net new jobs are projected. Many of the positions will require tech-savvy candidates to keep pace with future developments.

Unfortunately for employers, today's students are consistently underperforming in the fundamental skills of science, technology, engineering, and math (STEM). Executives reported that, on average, no more than 45% of applicants are passing basic skilled-trade aptitude tests. Colleges and universities have developed programs to help (see "New Technology Is Key to Recruiting New Power Workforce" in the forthcoming June issue of *POWER*), but that is only scratching the surface of the need.

Increasing access to women, minorities, and veterans (watch for "Veterans Bring Needed Skills to the Utility Industry" also in the June issue of *POWER* and at powermag.com) is a high priority for many of the companies surveyed by Manpower. Although women and minorities are generally underrepresented in STEM-related professions, outreach to these groups is believed to have helped increase their numbers. Statistics are hard to come by however, because the programs frequently consist of informal support and internal networking groups where success is not always tracked.

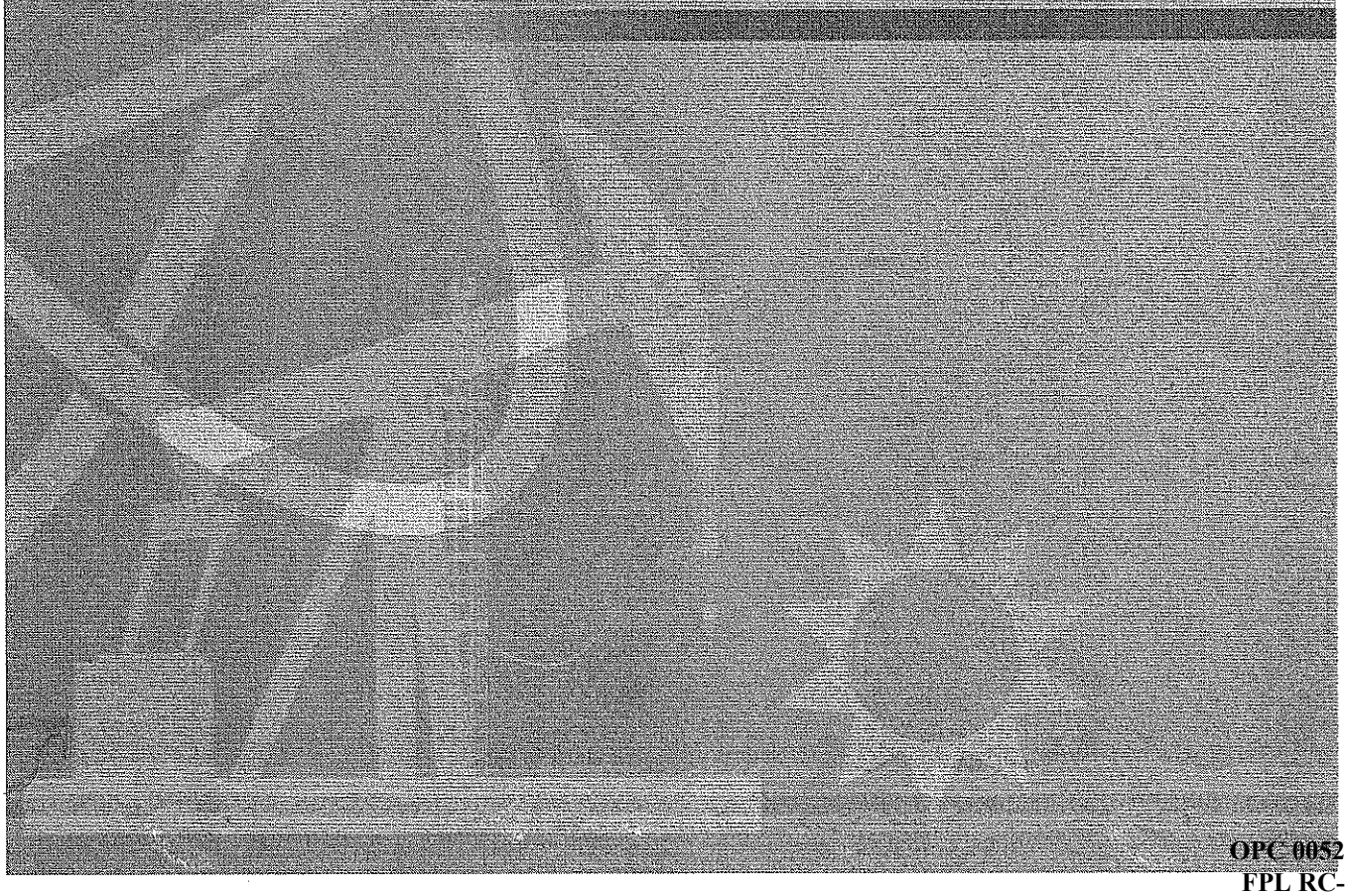
If the "double squeeze" wasn't challenging enough, screenings—including drug tests, driving record reviews, and background checks—present another sticky wicket. Manpower referenced a Pennsylvania Chamber of Commerce study in which one in three members surveyed said that background checks and criminal records were an issue in hiring. One Manpower survey responder even estimated that half of all applicants for entry-level jobs at his agency were unqualified due to their inability to pass the screening process.

—***Aaron Larson**, associate editor (@AaronL_Power, @POWERmagazine)*

DETAILED REPORT FOLLOWS →

Manpower®

Strategies to Fuel the Energy Workforce



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Methodology: The Manpower Energy Workforce Study

To capture stakeholder concerns about and strategies for overcoming the talent shortage in the energy industry, Manpower conducted a series of 17 one-on-one phone interviews with human resource executives, training and education experts and workforce development advocates in the U.S. and Canada energy industry. Interviews were conducted between September 6 and November 25, 2013 according to a predetermined questionnaire. In addition to the insights obtained, the interviews informed a subsequent online survey of 26 questions. The online survey was distributed via email to more than 6,000 energy company executives between November 5 and December 20, 2013.

Responses (n=76) are equally distributed between upstream (exploration and production), midstream (transportation, storage and wholesale marketing), and downstream/utilities (refinement, processing and delivery). Sixty-five percent of respondents hold job titles of Manager/Supervisor or Director. Forty-eight percent work in human resources with the remainder in operations, technology or other functions. Twelve percent of survey respondents work for companies employing fewer than 250 employees, 18 percent with 250-1,000 employees, 44 percent with 1,000-5,000 employees, and 33 percent with more than 5,000 employees. While only five percent of survey respondents indicate their company's home office is based in Canada, 28 percent of survey respondents report operating in Canada.

In addition to the primary research data, statistics from various secondary research sources were used in the preparation of this report to substantiate or contrast the research findings.

Given the small sample size, only survey outcomes that show a significant and consistent majority of opinion are cited here. Survey outcomes in this report are not statistically projectable.

Existing research data for the energy industry is compiled largely by sub-sector (e.g., oil and gas, solar, utilities) and cannot be aggregated to represent the diverse nature of the energy industry as a whole.

OVERVIEW

The energy industry in the United States and Canada is changing dramatically. It has the opportunity to transform from an industry in decline, to one of growth and opportunity. However, to fully realize its growth potential, the industry needs access to the right talent supply.

Without that talent, billions of dollars in energy company investments and new technologies could go to waste. The potential to be a leading global exporter of energy could go untapped. Establishing a competitive advantage for talent above and beyond that of growing industries, such as information technology and health care, is essential.

Talent is the new driver of growth for the 21st century.

Manpower's new four-part series, *Strategies to Fuel the Energy Workforce*, examines today's talent shortage, the drivers behind it, mistaken perceptions about the industry, and the best practices of companies and educators. It provides a framework for understanding the workforce strategies that energy companies can use to gain competitive advantage and ready themselves to compete domestically and globally.

To understand what keeps executives up at night and learn more about the innovative workforce practices that are getting results, Manpower conducted a series of one-on-one interviews with energy company executives, educators and workforce advocates in North America. In addition to providing rare insights into this topic, the interviews informed the development of an online survey that helped quantify the scope and urgency of the talent shortage.

What emerged is a sobering picture of immediate needs and a future with grave loss of opportunity unless proactive and cooperative action is taken. Business leaders must be able to make faster decisions with a nimble and agile workforce to get at the heart of the solution.

The study is presented in four reports:

- **Report One: The Energy Workforce Crisis**, focuses on the drivers of the talent shortage, namely a "double squeeze" on workforce talent. High rates of retirement create a gap in the talent needed, while a broken education system and clogged pipeline of skilled entry-level employees give cause for increasing concern. Meanwhile, rapid technological change is reinventing the industry and simultaneously making it difficult to forecast talent needs.
- **Report Two: What's Working in Energy Workforce Development**, examines the best practices of companies and educators working to overcome the talent shortage. Four strategies are discussed: 1) building the supply of skilled workers, 2) increasing access to talent, 3) mitigating the demand for new talent, and 4) forming cross-sector collaboration to scale best practices.
- **Report Three: Rebranding Energy Jobs**, looks at a largely understated problem: the need to rebrand energy jobs to better appeal to younger workers. Negative perceptions and misinformation about today's energy jobs among parents, students and career counselors have led to a generation of skilled workers steered toward information technology and healthcare jobs over good-paying energy positions.
- **Report Four: A Call for Collaboration**, proposes a path forward for the industry and outlines what executives, policy makers and educators can do today to ensure a brighter workforce future.

The bottom line is that the talent shortage in the energy industry has become too large and complex a problem for any one stakeholder or group to solve. Collaboration between companies, educators and government is necessary to ensure that companies thrive, and the energy sector remains a key driver of economic growth for decades to come. Companies need to share their needs more openly while educators need to focus on early STEM education and build portable and standardized curricula customizable to changing needs and technologies. The series provides a blueprint for navigating the certain uncertainty that characterizes the energy industry.

Report One:

The Energy Workforce Crisis

The North American energy industry faces a unique "double squeeze" of its workforce with shortages of skilled workers at both the entry and the senior levels. Three factors are driving this trend including the aging out of the workforce, rapid technology and innovation advances, and a breakdown in education at every level. As a result, the industry finds itself lacking the talent it needs to capitalize on growth opportunities.

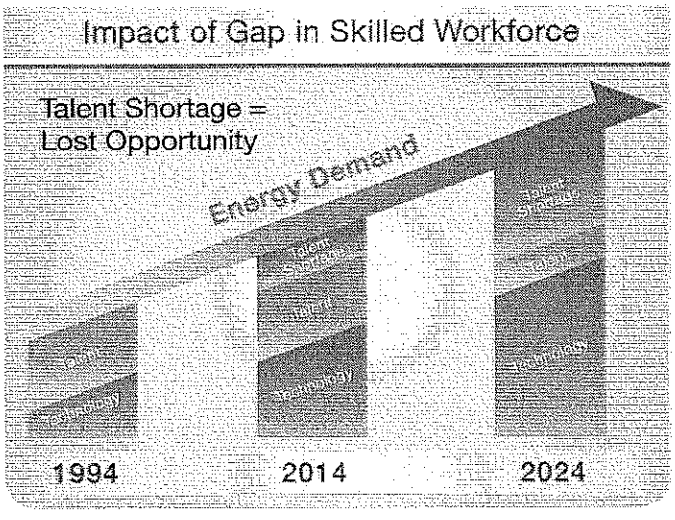
The energy industry in the United States and Canada is changing dramatically. It has been transformed from an industry in decline to one of growth and opportunity. New technologies combined with increasing global demand for energy, positions the United States and Canada to benefit as two of the world's leading exporters.[1]

The energy industry is investing billions of dollars in new technologies, capital and reserves. By mid-decade, half the households in the United States will have a smart meter.[2] The Canadian Energy Research Institute estimates that $253 billion will be invested in new oil sands capacity over the next quarter century.[3] However, companies can only maximize their return on investment when they have the workers with the technical knowledge and expertise to leverage it. The industry clearly needs a new type of technology-savvy workforce to fully realize that value.

Today, an energy company's ability to compete and realize economic growth relies on a skilled workforce. This is especially relevant for the energy industry since it is one of the most capital-intensive industries. Historically, that has translated into the use of traditional capital assets and investments to drive growth. The urgency today however is to transition to a focus on human capital that addresses the looming talent shortage. ManpowerGroup defines this as the Human Age—the era in which talent is the new driver of growth, eclipsing the importance of physical assets as the competitive differentiator.

Some energy companies identify that a talent shortage is already putting the brakes on growth and expansion. As global demand for energy increases, particularly in Asia and India, the U.S. and Canada are poised to supply it – if they can find the workforce to support the industry's growth. If they can't, the lost opportunity is high. Global energy markets will go untapped, and the industry that contributed significantly to the rebound from the recession of 2008 will not realize its full economic potential.

Some companies are already investing in workforce development and training. A review of the larger landscape reveals that many are reinventing the wheel – developing in isolation their own unique outreach or training programs. This report sheds light on what keeps energy executives up at night and the strategies that help companies maximize their return on workforce investment (ROWI).



The magnitude and urgency of the talent shortage

Today many industries are facing a shortage of skilled workers. However, few are facing a shortage of the magnitude and urgency found in energy. The North American energy industry is extremely large and diverse – employing nearly ten million people.[4] It includes both conventional and unconventional sources of energy. Job roles are as diverse as the industry itself – from utility linemen, to drilling rig workers, to wind farm operators and research and development engineers.

Global energy is a growing market. According to the U.S. Energy Information Administration, worldwide demand for energy is projected to increase 35 percent between 2015 and 2035.[5] This is largely due to the anticipated industrialization of China and India.[6] Therefore, in addition to supplying energy needs at home, there is significant opportunity for the U.S. and Canada to become the new exporters of energy. This export opportunity is also becoming a focus of regulatory reform in Washington.[7]

While some subsectors like nuclear energy and coal production have been stagnant or declining, an explosion of growth in the oil and gas sector has driven demand for energy jobs to new heights.

Nearly three-quarters of energy executives

72%

believe the ability to attract quality candidates to the energy industry will have a significant impact on North American competitiveness in the decades to come

– Manpower Energy Workforce Survey

Demand for energy jobs soar

- The U.S. shale oil and gas industry directly and indirectly employs 1.7 million people. By 2015, it is expected to rise by 50 percent to 2.5 million jobs before reaching 3 million jobs by 2020.[8]
- In the utilities subsector, it is projected 100,000 new jobs will be created by 2020 when a substantial number of utility employees reach retirement age.[9]
- The forecast for renewable sectors (e.g., solar and wind power) is slower but steady growth by 2020.[10] Jobs in wind power alone are projected to double by 2030.

One of the reasons that the talent shortage concerns energy executives is because they are experiencing the early signs of it today. More than half of energy executives say their companies struggle to find needed talent, while nearly three-quarters expect the problem to get worse in the next five years. In contrast, only 34 percent of all employers globally have difficulty finding staff with the right technical skills, according to ManpowerGroup's 2013 Talent Shortage Survey.[11] Yet, the jobs employers report having trouble filling are similar to those in the energy industry: skilled trade workers, technicians, engineers and IT staff.[12]

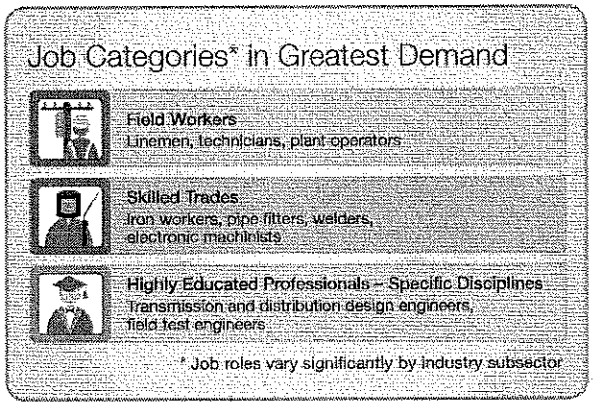
58% of energy executives say their company "struggles to find the talent it needs."

74% say the problem will get worse in the next five years.

– Manpower Energy Workforce Survey

Since Canada and the United States compete in the global marketplace for energy workers, the uncertainty of factors such as expanded hydraulic fracturing in Mexico, China or Russia could further increase demand and competition for energy workers here at home.[13] Should this occur, exporting energy workers in North America could become a critical issue. Mexico's recent decision to open up bidding on foreign investment and energy exploration only makes the issue more intense.

In summary, while the talent shortage for skilled workers is a critical problem for business, its magnitude and urgency is especially acute in the energy industry – where the lost opportunity equates to a loss of global competitive advantage and untapped opportunity for growth. How did this shortage come about? Manpower's research identifies three drivers of the talent shortage in the energy industry.

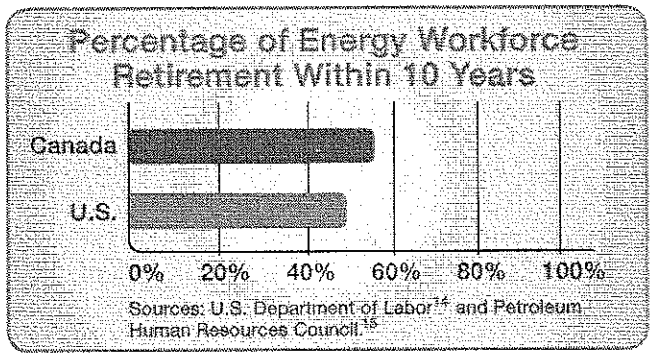


Factors driving the "double squeeze"

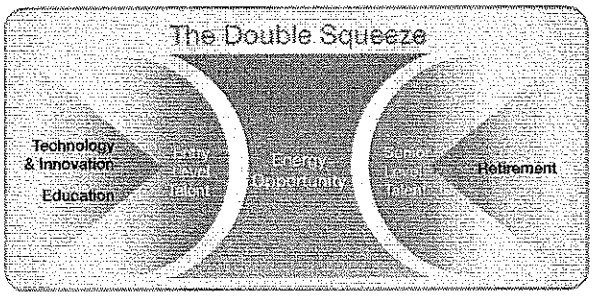
Through years of tracking macro-economic forces, ManpowerGroup identified four current trends impacting the world of work.

World of work trends

- Demographics / talent mismatch
- Technological revolutions
- Rise in customer sophistication
- Individual choice



These dynamics continue to intensify and are playing out in the energy industry as well. The result is that the energy industry faces a unique "double squeeze" of its workforce with shortages of skilled workers at both entry and senior levels.



According to Manpower's research, the talent shortage in energy is driven by three main factors, which support the workforce trends.

1. **Aging out.**
The issue of demographics and the talent mismatch, which affects energy companies in particular in the form of a rapidly aging workforce, speaks directly to the agility that competitive organizations now require. At the same time, more sophisticated customers (including organizational "customers") with a global mindset demand a higher quality, faster experience than they ever have before.

2. **Technology and innovation.** Rapid advances in technology impact not only the talent needed, but how employers compete for available talent. In addition to technological revolutions that change the way people work, this is also impacted by the concept of individual choice, which connects a potential employee's motivations and preferences to the potential employer of choice.

3. **Breakdown in education.** In many ways, the North American educational system has failed to consider demographic and technological trends in the world of work as educational priorities are set. This is of special concern to the energy industry, whose growth is dependent on a pipeline of students with adequate preparation in STEM.

Driver #1: Aging out

The first driver of the "double squeeze" on the energy workforce is retirement and attrition.

While the global recession slowed retirement somewhat, it merely postponed the inevitable. Shrinking 401Ks, reduced consumer confidence and concerns about new health care laws in the United States resulted in thousands of energy workers staying in their positions.

Energy Leaders Rank the Issues of Most Concern

Issue	Average Ranking*
Aging workforce	2.24
Lack of qualified workers	2.80
The "missing middle" (lack of middle-aged workers)	3.37
Wage pressure induced by competition for talent	3.71
Limited pipeline in energy-related educational programs	4.43
Lack of qualified front-line leadership	4.45

**On a scale of 1 – 6. 1 represents the most important issue, and 6 the least important issue.*
Source: Manpower Energy Workforce Survey

Interviews with energy executives show the "aging workforce" is the number one concern, followed by "the lack of qualified workers" and "the lack of middle-aged workers."

The unintended consequence of the aging-out problem is that there is both an experience and a leadership gap at the management level. Compounding the situation, the recession curbed professional development and training activities for younger employees. Now those employees are being tapped prematurely for leadership roles. Interviews with energy company executives reveal missing skills including leadership, business acumen, organizational preparation and time management.

Urgency with Utilities

46 avg age of utility worker[16]

50% of workforce is over 40[16]

36% of workforce to retire in 2 years[17]

60% of workforce to retire in 10 years[17]

18,000+ could retire at any time[16]

– Center for Energy Workforce Development Survey

"A lot of the younger set is being pressed more and more often to take on leadership roles at an earlier age because there's that 15- or 20-year gap in labor between the 50s and the 30s crowd," describes Josh Hickman, president, Young Professionals in Energy, Pittsburgh and head of Hickman Geological Consulting. "It is up to the company to figure out ways to make them ready…or throw them into the fire and figure out ways to manage that."

Aging Out + **Lack of New Talent** = **Leadership Gap**

Driver #2: Technology and innovation

The second driver of the "double squeeze" on the energy workforce is rapidly changing technology. In energy, innovation is necessary not just to remain competitive, but also because the industry as a whole is undergoing a fundamental shift in focus. For example, the move into unconventional resources and new environments such as ultra-deep water in the Gulf of Mexico and the Arctic are presenting new technological challenges.

86% of executives say today's energy workforce requires a more complex skill set than it did five years ago.

90% say today's laborers and front-line workers require higher levels of technical competency than they have in the past five years

– Manpower Energy Workforce Survey

The wide array of potentially unconventional sources means that companies without immediate access to the right technologies risk being left behind. Similarly, using technology to reduce costs and extend the life of conventional production through enhanced recovery techniques, will be critical to future commercial success. The potential of these new technologies is dependent on the workforce that will need to use them.

The development of emerging technologies and the integration of existing technology into the energy industry are game changers for nearly all job roles.

The increased use and innovation of horizontal drilling and hydraulic fracturing is accelerating the need for technological skills. Concerned stakeholders are also demanding increased sophistication from these technologies regarding their environmental safety and reliability. However, for the existing workforce many of their skills are not easily transferable, and training is a relatively slow process.

Executives articulate how technology now defines the skill sets of the workers. "Technology has become part of every job that we have," explains Ann Randazzo, executive director of the Center for Energy Workforce Development. "And in some positions, like those in transmission distribution operations, it has totally changed the jobs."

> "It can take between nine and 18 months to train a worker who may already have seven or eight years of oilfield experience and shift them into work that involves hydraulic fracturing. These are generally not university grads...these are people that were trained on the job. The technology used in hydraulic fracturing and the increased activity in this area is leading to significant new training requirements."
>
> *– Cheryl Knight, former executive director, Petroleum Human Resources Council, a division of Enform Canada*

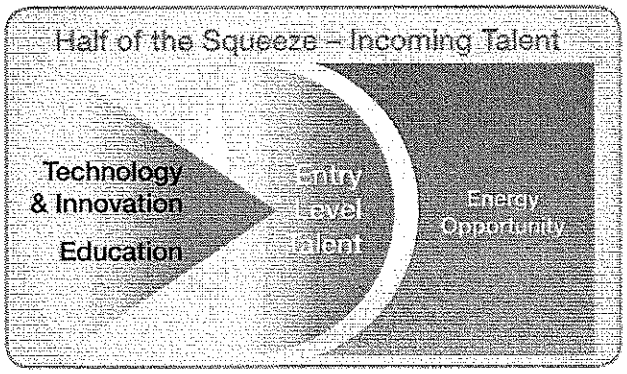
One example is the installation of hundreds of thousands of new "smart meters" by utility companies that collect and transmit usage data. This fundamentally changes the role of meter readers from manual data recorders to workers in IT departments who manage the computers and data from those meters.

The need for technology skills for front-line leadership jobs also make career transfers from the contracting, coal or construction industries difficult. Front-line leaders now use a laptop to report back with spreadsheet programs, and linemen often must troubleshoot electronic devices attached to equipment up on the lines. However, many career changers have limited computer literacy skills.

Susan Whisler, director of the Southern Alleghenies Workforce Investment Board, paints a vivid picture of the challenges associated with training career changers. "We realized that we were dealing with functional [computer] literacy...especially where dislocation has affected large numbers of older individuals. In some cases, they have no computer experience and have no idea how to even hold a mouse, let alone how to use one as part of their job."

"Industry and educators agree – today's workers must be tech savvy," explains Dean Randy Pacheco of San Juan College School of Energy. "Employers tell us future employees need to be able to work in a technology evolution ... a worker can be provided, wirelessly,

real-time data on production ... that type of virtual environment didn't exist 20 years ago. So, we have to change our courses to provide the education necessary to meet the industry's expectation."



In some energy subsectors, such as utilities, those schooled in newer technologies may lack the knowledge associated with the older analog infrastructure that remains in use today. They are caught in a technological "no man's land" that is exacerbated by the aging-out problem. Industry executives report that this can be a challenge for front-line leaders, with one saying: "Young people coming out of college are well prepared in the 21st century technologies, but they don't have the practical knowledge of the 20th century technology that constitutes most of our electrical system."

Technology-based skill sets associated with big data analysis are not among the top-of-mind concerns of energy executives in interviews. Unlike the manufacturing and healthcare industries, big data issues are nascent in the energy industry. However, they are sure to be central to the next frontier for innovation, productivity and growth.

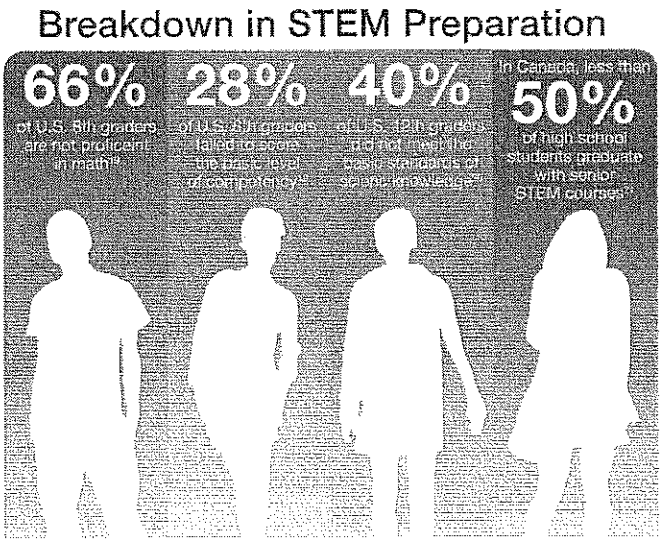
Growing environmental concerns that include the prospect of stricter carbon emission controls are incentivizing companies to invest in technology and R&D. Those companies with workforces best able to overcome these challenges will be the most successful companies of tomorrow.

Driver #3: Breakdown in education

The third driver of the "double squeeze" on the energy workforce is a breakdown in the education of young workers. Energy executives consistently express concern about the lack of fundamental skills in STEM (Science, Technology, Engineering and Math) fields. Often, young applicants don't have the basic STEM literacy skills they need – and it couldn't come at a worse time for the energy industry.

> Executives report pass rates of **40-45%** on basic skilled trade aptitude exams.
> – *Manpower Energy Workforce Survey*

This problem is especially acute for the hiring of potential craft laborers, such as linemen, that requires a high school education and passage of a basic aptitude test such as the Edison Electric Industry (EEI) skilled trade aptitude exam. Executives report to Manpower average pass rates of 40-45 percent with the most problems seen in applied math.



One industry leader describes it this way, "Fundamental skills, applied mathematics – and some of it is simple – such as being able to calculate the area of a square, or translate feet to inches and yards to miles. More simple scientific concepts like levers and pulleys are important in the type of work we do. In basic science…basic math… [potential hires] come up short." The decline in STEM literacy exists on two levels, K-12 education and college.

Statistical realities, combined with a lack of practical experience translate to a low degree of employer confidence regarding students' level of preparation at the secondary school level. Of the survey respondents, 42 percent believe recent graduates are not adequately prepared for available jobs without additional training.[26] More than a quarter of the executives indicate that they do not believe that educational institutions understand the immediate needs of energy employers.

> **42%** of executives say recent graduates are not adequately prepared.
>
> *– Manpower Energy Workforce Survey*

In sum, demographic shifts, the rise of technology innovation and a breakdown in STEM education at all instructional levels have driven a serious talent shortage in the energy industry for entry-level and senior-level positions.

Screening tests are a stumbling block for many

If the "double squeeze" wasn't challenge enough, energy executives now face a relatively new HR challenge: screenings. A significant majority of interviewed executives and other workforce stakeholders express concern about the inability of candidates to pass required drug tests, driving record checks and background checks. By one survey responder's estimation, only 50 percent of the applicants for entry-level jobs at his job-training agency are considered qualified candidates due to their inability to pass background-oriented screening tests.

"Fifty years ago, industry drug screens were rare for employment," explains Randy Pacheco, dean, San Juan College School of Energy. "Fifty years ago, companies didn't require that you have a good driving record. Today, that's all changed, and people are subject to these rules. It is mandatory. It's absolutely no DUIs. And these are some of the issues we face, trying to find our next workforce."

Huge Gaps in Higher STEM Education

STEM bachelor's degrees have been declining since 1985.[22]

Women are less likely to pursue degrees in STEM than men.[23]

Black and **Latino students** are less likely to pursue STEM degrees than white students.[24]

Only **14%** of engineers are women.[25]

–U.S. Congress Joint Economic Committee, "STEM Education: Preparing for the Jobs of the Future

The energy industry is not alone in this quest. In a 2013 Pennsylvania Chamber of Commerce Workforce Study, 32 percent of their members surveyed said background checks and criminal records were an issue in hiring.[27] This is one reason drivers rank eighth among the global top 10 jobs employers are having difficulty filling in ManpowerGroup's 2013 Talent Shortage Survey, and why that particular job role appears on the list year after year.

Conclusion

The shortage of skilled workers is a serious reality for the energy industry. The shortage is large, and it is also urgent, fueled by the "double squeeze" of unfilled openings at both the entry and senior levels. Specialized skill sets are increasingly defining job roles, and a breakdown in the STEM education system is widening the gap. Society must recognize that today's underperforming ninth graders in math and science are the entry-level front-line energy workforce of 2017-2019.

Companies and other stakeholders have to be proactive in the development of short- and long-term solutions. Workforce agility is the appropriate response to rapidly changing technology now and in the future and key to maximizing return on workforce investment (ROWI). Employers can't inherently predict the dynamics that shape uncertainty (e.g., market volatility, compressed economic cycles, greater pressure for faster time-to-value, etc.), yet they can plan for workforce flexibility and agility. This requires simplification – a streamlined organizational structure designed to boost empowerment, employee engagement and productivity.

The energy industry has high growth potential as evidenced by the massive investments being made in new technologies. The key now is to prepare a workforce that is able to maximize that potential. If we fail to do so, the lost opportunity will be high.