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Education, Employment Opportunities, and Energy Reform in Mexico

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INTRODUCTION

Mexico's energy reform—the new constitutional framework and enabling legislation—seeks to create an environment more conducive to private and foreign direct investment in the energy sector. Foreign investors will have the ability to partner with PEMEX and also pursue sole ventures through government contracts. Investors will also be allowed to participate in the generation, transmission, and distribution of electricity.

It is expected that the energy reform will boost employment opportunities, especially in jobs requiring skills in energy-related occupations. For example, in the United States, for every job created directly in the oil field, another three to four are created in areas such as information services, training, health care, housing, education, and manufacturing.[1]

Mexico must address two key questions in order to realize the promise of greater employment opportunities: Does the country's current workforce have the needed skills to adequately respond to increases in production, and is the country allocating the necessary resources to respond to the demand for future skills?

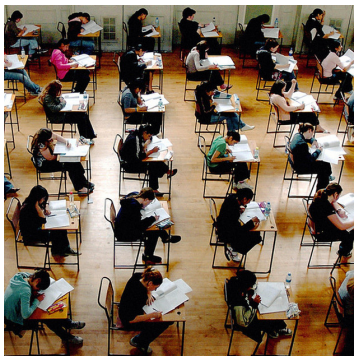
This issue brief addresses these questions. It will focus on the northeastern states of Nuevo León, Tamaulipas, Coahuila, and Chihuahua, given the expected increase in energy jobs in these areas after the implementation of the reform. Finally, it will present current efforts to address the workforce gap in Mexico.

WORKFORCE AND SKILLS GAPS

The data available indicate that Mexico will face a skills gap—a deficit in the skills employers seek versus the skills available in the current workforce—as the energy sector expands. This workforce gap results from changes in policy, demographic changes (older workers retiring), and the low number of students in fields related to the energy sector, among other factors.[2] In Mexico, only 9.4 percent of all employed citizens have a higher education degree, which indicates a gap in high skills.[3] In addition, within five years, 20 percent of the employees at Pemex and Mexico's National Commission of Hydrocarbons are expected to retire.[4]

In order for Mexico to fully reap the benefits of energy reform for employment, it must focus resources to produce talent. Education in skills related to the energy sector must be strengthened along the primary, secondary, and postsecondary education continuum, and workforce conditions in the energy sector must also be attractive to prospective employees.

Mexico also lacks sufficient numbers of students enrolled in high school and postsecondary education. According to the National Institute of Statistics and Geography (INEGI), in Mexico, 43 percent of people between 15 and 19 years of age are not enrolled in any education program (high school or vocational training), and only 5 out of 100 individuals over 20 are currently in school.[5]



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Mexico should also encourage and prepare high school students to enter STEM careers (science, technology, engineering, and math), because having a strong basis on these subjects is important for successful postsecondary studies in energy sector careers.

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Furthermore, Mexico should also encourage and prepare high school students to enter STEM fields (science, technology, engineering, and math), because having a strong basis on these subjects is important for successful postsecondary studies in energy sector careers. The Organisation for Economic Co-operation and Development (OECD) conducts the Programme for International Student Assessment (PISA), a triennial international survey that evaluates education systems worldwide by testing the skills and knowledge of 15-year-old students.[6] PISA 2012 found that, although between 2003 and 2012 the number of students enrolled in school increased from 53 percent to 70 percent, Mexico still has the third-lowest number of students enrolled of all the assessed countries. The assessment also found that while math competency has improved, 55 percent of students are still behind their peers in the other OECD countries on basic math skills. The results for science skills were not much better, with 47 percent of students not reaching basic competency levels. In both math and science, Mexican students are two years behind their OECD peers.[7] Before they even graduate high school, students are already less likely to succeed in STEM fields.

Energy sector careers in fields such as engineering and earth sciences are also unattractive options for students. According to a study by the Mexican Institute for Competitiveness (IMCO) in 2014, the majority of undergraduates are seeking careers in business administration, accounting, law, education, medicine, and IT. Careers in earth sciences, manufacturing, mining, and extractive activities are in the bottom 10 fields chosen by undergraduates.[8] These fields are invaluable to a successful energy sector. Therefore, Mexico needs to prepare more students in fields directly related to energy, such as mechanical, industrial, electrical, chemical, and petroleum engineering and mining/geological sciences.

Retention rates are not promising either. Calculating desertion rates is a complex issue that relies heavily on available data and student information, which is not readily accessible. That said, a 2011 study estimates that 25 percent of enrolled students do not complete their degree in their chosen field. Some students change degree paths, take a hiatus, or simply leave the education system altogether. Overall, engineering and science degrees tend to be more demanding and consistently have lower graduation rates.[9] For example, a study by the consulting firm Engineering Trends reported that of the 24,000 engineers that graduate annually in Mexico, only 1 percent are petroleum engineers.[10] Thus, despite the energy sector being one of the highest-paid fields in Mexico, it fails to attract a sufficient number of college graduates in engineering and science.[11]

The regional impact of energy reform should also be considered. It is expected that the northeastern states of Chihuahua, Nuevo León, Tamaulipas, and Coahuila will receive an influx of investment given their similar geography to the very successful Eagle Ford shale play in South Texas. Currently, in Nuevo León, 12.3 percent of the population has a postsecondary degree, and 1.2 percent has a postgraduate degree—the second-highest concentration of a degree-holding population after Mexico City. Coahuila follows with 10.9 and 0.8 percent, respectively, Tamaulipas with 10.7 and 0.7 percent, and Chihuahua with 8.9 and 0.8 percent.[12]

There are many technological institutes in the northeastern states that provide undergraduate programs in relevant areas of studies for the energy sector, such as the Tecnológico de Monterrey and the Universidad Autónoma de Nuevo León, which are among the 10 best universities in Mexico.[13] That said, the majority of petroleum engineers in Mexico graduate from the Instituto Politécnico Nacional and the Universidad Autónoma de Mexico, which both produce around 200 petroleum engineers a year.[14] These numbers are well below the number of jobs likely to be produced by the new investment.

COLLABORATIVE SOLUTIONS TO A SHARED PROBLEM

Mexico faces a big challenge: preparing the skilled workforce needed for the expected investments arising from the implementation of energy reform. A timely

and adequate response to the energy sector's needs will benefit both the Mexican people and the national economy.

Looking ahead, the proposal from the Office of the President to create the Mexican Petroleum Fund for Stabilization and Development is a step in the right direction. The fund would administer the petroleum income to strengthen national finances and would, among other things, support investments in higher education.[15]

Long-term and stable resources for higher education are important, but they must be accompanied by continued efforts to boost enrollment in primary and secondary education as well as to increase the pool of students that are prepared for STEM careers. Increasing enrollment for energy-related degrees is also key, but it must encompass all levels of skill and job opportunities, from engineers to welders and everything in between. This must be accompanied by attention to retention strategies that will keep enrolled students motivated to complete their degrees. Schools must also focus on teaching English. The opening of Mexico's energy sector will require local talent to be able to communicate with future employers and with the world at large.

To meet the future demands of both Pemex and international oil companies, coordination between government actors at all levels, tertiary education institutions (including public and private universities as well as technical schools), and civil society organizations is crucial. The Mexican government should promote bridge-building between national and international universities, companies, and think tanks to contribute to human capital development in Mexico.[16]

The Mexican government and energy companies should promote outreach programs to attract students to careers in the energy sector. Examples include career fairs, business outreach to local schools, and internship or job-shadowing opportunities for students. These programs can both increase awareness of the potential career paths available in the energy field and create stronger relationships between industry and the community. In this vein, IMCO launched a website that offers students information about choosing a degree—including where to study, expected earnings, and return on investment.[17]

Mexico does not have to reinvent the wheel on this. Texas, which is currently dealing with the shale boom, recently faced a shortage in the local, skilled workforce. The business community, local universities and community colleges, and independent school districts are now working collaboratively to guarantee that there is both a workforce to meet business demands as well as opportunities for local students to benefit from the boom.[18] The Greater Houston Partnership, which serves as the city's chamber of commerce, put together the Regional Workforce Development Task Force, comprised of business members and social service and education representatives, mostly focusing on the middle-skills gap in the region. In Mexico, the government of Nuevo León brought together local business, government, and academia representatives to prepare the Plan Sectorial de Energía del Estado de Nuevo León 2014–2015[19] (Energy Sector Plan for the State of Nuevo León 2014–2015), which analyzes the energy potential for the state, examines the current data, and proposes public policies that will help Nuevo León benefit from the opportunities that the reform will bring.

Finally, in order to understand the workforce challenges and prepare the most adequate responses, it is important for the government, both at the federal and local level, to improve the collection and availability of data and statistics on education and the workforce, especially as they relate to understanding the skills gaps for low- and middle-skilled jobs, about which very little information is available.

The Mexican government should promote bridge-building between national and international universities, companies, and think tanks to contribute to human capital development in Mexico.

ENDNOTES

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