



**STATEMENT OF DONALD “CHIP” STOICOVY
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**TESTIMONY ON “AMERICAN ENERGY JOBS: OPPORTUNITIES FOR INNOVATION”
BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON NATURAL RESOURCES,
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES
THURSDAY, JUNE 12, 2014**

Chairman Lamborn, Ranking Member Holt, and Members of the Committee, I welcome the opportunity to testify today on issues related to innovation, jobs, and the American energy sector. My name is Chip Stoicovy, and I am the Vice President for Oil & Gas and Industrial Gas Services at Air Liquide Industrial U.S., a company responsible for providing bulk gases and related services to a very diverse base of customers in the U.S. including those in the automotive, chemical, food, pharmaceutical and metals industries. My company is a subsidiary of American Air Liquide, one of the Nation’s leading industrial and medical gas companies. Headquartered in Houston, Texas, Air Liquide has over 5,000 U.S. employees in more than 200 locations throughout the country.

I have been with Air Liquide for over 22 of my 31 years working in the industrial gas sector, most recently as the Vice President for Oil & Gas and Industrial Gas Services. In this role, I have gained an appreciation for the complexities of the energy market as well as the importance of industrial gases to almost every sector in the U.S. economy. In this sense, Air Liquide tracks the Nation’s economy and that experience informs our view that the key to a strong economy is a climate that promotes innovation. As a company, Air Liquide is focused on technological innovation to help make our Nation’s energy, manufacturing, and industrial sectors more efficient, environmentally friendly, and productive. My focus today will be on Air Liquide’s role as an innovator in this energy renaissance and how our technology is in use today making the production process more efficient and environmentally friendly.

I. THE AMERICAN ENERGY RENAISSANCE

The American “energy renaissance” has brought with it an unparalleled opportunity for our Nation’s economy, environment, and national security. As noted by the U.S. Energy Information Agency – the EIA – and countless news outlets, the United States has become the world’s largest producer of oil and gas combined, surpassing even Russia.¹ The International Energy Agency – the IEA – has reported that, overall, the United States crude oil supply in 2013 registered the fastest annual supply growth of any country in the last two decades, rising 15%.² Data from individual states support this picture. For

¹“U.S. Is Overtaking Russia as Largest Oil-and-Gas Producer,” *The Wall Street Journal*, October 2, 2013, <http://online.wsj.com/news/articles/SB10001424052702303492504579111360245276476>

²“US crude production continues relentless rise: IEA,” CNBC, January 21, 2014 <http://www.cnbc.com/id/101350187>



example, from 2010 to 2013, North Dakota's crude oil output grew 177 percent and Texas's output grew 119 percent.³ With a positive economic picture and commonsense energy policies, the U.S. could soon pass both Russia and Saudi Arabia as the world's top oil producer.⁴

This energy boom has revitalized North America—not only through the economic and societal benefits of energy independence—but also as a manufacturing leader. Low cost and abundant energy has without doubt been instrumental to an economic resurgence in many sectors of the economy and many regions of the country, as a report from IHS Global Insight in 2012 noted.⁵ The lower natural gas prices achieved by shale gas are anticipated to raise industrial production by 2.9% as early as 2017 and upwards of 4.7% by 2035. Whether it's used to generate electricity, to fuel the next wave of clean burning vehicles, or as a raw material in the production of petrochemicals—the abundance and affordability of natural gas is driving growth and prosperity, and making us more secure.

Lower energy prices here at home are fantastic, of course, but the employment benefits are even more important. That same IHS report also indicated that unconventional gas already supports more than 1 million jobs and will support nearly 1.5 million jobs by 2015. The top ten producing states – such as Texas, Louisiana, Colorado, and Pennsylvania – are experiencing compound annual job growth rates of nearly 8 percent, significantly above the average rate of 1.6 percent growth rate predicted for total U.S. employment.⁶

A new report released by the White House's Council of Economic Advisers just two weeks ago also supports this picture:

Rising domestic energy production has made a significant contribution to GDP growth and job creation. The increases in oil and natural gas production alone contributed more than 0.2 percentage point to real GDP growth in both 2012 and 2013, and employment in these sectors increased by 133,000 between 2010 and 2013...These figures do not account for all the economic spillovers, so the overall impact on the economy of this growth in oil and gas production is even greater.”⁷

When energy is abundant and affordable, local economies grow jobs not only in manufacturing but in information services, health care, housing, and more. And individual citizens, as well as our communities, benefit in turn.

³U.S. Energy Information Agency, “Five states and the Gulf of Mexico produce more than 80% of U.S. crude oil,” March 31, 2014, <http://www.eia.gov/todayinenergy/detail.cfm?id=15631>

⁴“US oil, gas juggernaut on course through 2016: EIA,” CNBC, December 16, 2013, <http://www.cnbc.com/id/101276275>

⁵“Shale, Other Unconventional Natural Gas Supports More than 1 Million US Jobs Today; Nearly 1.5 Million By 2015, IHS Study Finds.” See more at: <http://press.ihs.com/press-release/energy-power/shale-other-unconventional-natural-gas-supports-more-1-million-us-jobs-to> and <http://www.ihs.com/info/ecc/a/unconventional-gas-report-2012.aspx>

⁶ “Shale, Other Unconventional Natural Gas Supports More than 1 Million US Jobs Today; Nearly 1.5 Million By 2015, IHS Study Finds.” See more at: <http://press.ihs.com/press-release/energy-power/shale-other-unconventional-natural-gas-supports-more-1-million-us-jobs-to> and <http://www.ihs.com/info/ecc/a/unconventional-gas-report-2012.aspx>

⁷“New Report: The All-of-the-Above Energy Strategy as a Path to Sustainable Economic Growth,” Council of Economic Advisors, Posted by Jason Furman, Jim Stock on May 29, 2014 <http://www.whitehouse.gov/blog/2014/05/29/new-report-all-above-energy-strategy-path-sustainable-economic-growth> and http://www.whitehouse.gov/sites/default/files/docs/aota_energy_strategy_as_a_path_to_sustainable_economic_growth.pdf



II. INNOVATION IN HYDRAULIC FRACTURING

The energy renaissance we see today is only possible because of technological innovations in hydraulic fracturing and horizontal drilling. As with every energy production process across the energy sector, it is important to manage the potential environmental impacts associated with shale gas development and, in this respect, we believe innovation will lead the way again.

One example where we see this occurring is related to the amount of water needed to develop an unconventional oil and gas well underground. The industry has made tremendous strides to improve its water management at fracturing sites as companies commonly save the water they deploy on-site, removing it to recycling centers where it is processed and cleaned, and then reused, over and over again with minimal volumes lost. Yet questions remain about the industry's high consumption of water overall, particularly at energy plays in regions where water is considered a particularly precious commodity. And even where water is relatively abundant, the cost of treatment of fracturing fluids and produced water for reuse, discharge or disposal can be significant. Depending on the amount of produced water and the treatment or disposal options available, the cost of dealing with the produced water can vary, ranging anywhere from \$20,000 to \$2 million, not to mention the initial costs of simply acquiring and recycling the water during the process. Regulations being considered at the Federal, state, county, and municipal levels are also expected to increase the costs associated with water used in hydraulic fracturing. But, thanks to ever further technological advances, these concerns may fade sooner than we imagined just a few years ago.

We at Air Liquide are proud to be at the forefront of innovative research and have successfully demonstrated the commercial application of industrial gas liquids in both hydraulic fracturing and coil tubing activities within the oil well service (OWS) market. Specifically, the industry has found that nitrogen or carbon dioxide foam-based fracturing is well suited for depleted or depressurized formations. Additionally, formations that are sensitive to water favor the use of nitrogen or carbon dioxide foam-based fluids. For example, the presence of certain types of clay, which swell in the presence of water, makes a formation particularly sensitive to water. Water also blocks pores in some formations and reduces their permeability. It's for many of these reasons that foams are now being sought to improve the delivery and efficiency of previously difficult formations, unlocking new potential around the country.

Similarly, coil tubing is used for a variety of procedures necessary in the horizontal drilling and hydraulic fracturing of wells. The procedures are numerous and include plug setting, sand control, borehole cleaning, and many more. Unlike hydraulic fracturing, which has historically favored the use of water, most of these procedures require the use of nitrogen or natural gas. Nitrogen-based foam is also used to clean out any debris following drilling and before the well is put into service.

Cost, of course, is a main concern. Current research by the University of Texas at Austin, Air Liquide, and elsewhere is investigating expected improvements in productivity that may be achieved by using foam fracturing fluids. Laboratory experiments and theoretical predictions support expectations of improved productivity in many cases. The use of industrial gases in the OWS market is currently very formation specific but will likely increase as water regulations and treatment costs accelerate. And, the intensity of use per well changes over time based on several factors, including OWS company



experience at the formation and the increased use of horizontal drilling rather than vertical drilling. Air Liquide is proud to be innovating at the edge of this interesting and vital portion of the booming energy sector.

The use of industrial gases in the unconventional development of oil and gas wells are not only improving efficiency and productivity, they are demonstrating water savings of nearly 50 percent, and continue to greatly impact the sustainability and environmental footprint of these processes.

III. BUSINESS, SOCIETY AND GOVERNMENT – COOPERATING FOR INNOVATION

So what do we need to do to catalyze and continue the North American energy renaissance? Air Liquide believes it starts with a renewed commitment by business leaders, by our society, and by our government to finding creative ways to unleash the innovation in our businesses and each other.

First, I believe leaders in the private and non-profit sectors need to be truly and unwaveringly committed to innovation. This means embracing new technologies, new applications for existing technologies, and a willingness to reconsider long-utilized practices. We must find ways to get the most out of all available resources.

For example, at Air Liquide, we are constantly seeking new ways to be a partner in the energy renaissance, helping to encourage its expansion and to nurture emerging technologies, always with an eye on growth and sustainability. We're finding ways to utilize gases like nitrogen and carbon dioxide to enhance oil and gas production and significantly reduce the amount of water needed in the hydraulic fracturing process, helping it become ever more efficient and sustainable.

Second, as a society, what can we do? One of our most critical priorities is to work together to better prepare our workforce to take advantage of the new, value creating jobs emerging today. Children need to be afforded the opportunity to grow and discover who they are when they're young, they need an education that provides a firm footing to be successful in the world around us, and when they're ready to enter the workforce, they need the foundation and skills required by our new economy.

Finally, what can government do? As an overall goal, government needs to embrace innovation and help propel growth. It must permit a state-of-the-art business community and a skilled and prepared workforce to thrive by making sure that it does not discourage creativity, research, and commercial application of American innovations.

We must do a better job of striking a regulatory balance that ensures that folks out there who see opportunities to invent a better way to do something or create a new market have the leeway and support they need to make that happen. Overly burdensome, complicated and redundant regulations make it impossible to truly capitalize on the energy renaissance – and inhibit development of long-term plans for growth and success.

IV. CONCLUSION

All of us at Air Liquide appreciate the Committee's attention to these important issues. We stand together with companies, big and small, across the country that embrace innovation and the employment



opportunities available when the Nation's energy sector is continually innovating and growing. Our companies, our employees, and our communities are in this together, and we all need to make an effort to ensure people understand what our companies do, the benefits our innovations bring, and the role we play in their lives. I thank the Committee for inviting me to testify, and I would be pleased to answer any questions you may have.