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Testimony on
"American Energy Jobs: Opportunities for Education"

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Subcommittee on Energy and Mineral Resources

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Introduction

Chairman Lamborn, Ranking Member Holt, and members of the Subcommittee, thank you for the honor of testifying before you today, and a special thanks to your kind and gracious staff. My name is Seth Lyman, and I am an environmental scientist with more than a decade of experience conducting research and developing measurement instrumentation. It is my privilege to direct environmental and energy research, and innovation and economic development at Utah State University's Bingham Entrepreneurship and Energy Research Center in Vernal, Utah. Our team works closely with industry to understand and solve environmental problems and to promote responsible energy development.

Recent growth in oil and gas production has created unique challenges and opportunities for the institutions of higher education that serve our region. The Uintah Basin Applied Technology College (UBATC) and Utah State University (USU) are working together to meet the growing workforce development needs of our energy industry and the public service sector. Through partnerships with local government and industry, scientific research at USU is creating solutions to local energy challenges and is providing valuable training and experience for our students.

Utah's Uintah Basin

The Uintah Basin, situated in rural northeastern Utah, near the borders of Wyoming and Colorado, has a population of about 50,000. Vernal, its largest city, has 10,000 residents. The area is home to world-class oil, natural gas, oil shale, and oil sands resources (Figure 1), and about 60% of the local economy is tied to the extraction industry. In terms of production, Utah is currently 10th in the nation for natural gas and 11th for crude oil, with almost 80% of the state's output occurring in the Uintah Basin. Those numbers pale, however, when viewed in light of recent estimates that the Basin contains hundreds of billions of barrels of recoverable oil from oil shale and 30 billion barrels of recoverable oil from oil sands. Commercial production of oil shale and oil sands is just beginning, but it is no exaggeration to say that the Basin will play a major role in securing our country's energy future.

Like other areas of the nation with oil and gas resources, the Uintah Basin's economy is strong and its population is growing. With an unemployment rate of 3.8%, a median household income 17% higher than national average, and a 9% population increase over the past three years, it is clear that energy development is having a positive economic impact on the community. With this growth, however, comes challenges, not the least of which is the need to educate a workforce capable of supporting the energy industry. Challenging, too, is the need to educate the generations brought to the Uintah Basin by that

workforce. In our case, energy development provides royalties, taxes, and other revenues to the local community, giving us an unprecedented opportunity to grow and strengthen our higher education system.

We know that education and research are important to maximizing the benefits of oil and gas production in our community, but they are absolutely indispensible if we wish to make a dent in the boom and bust cycles prevalent in communities that fail to also invest in the fundamental infrastructure of a diverse economy. USU and UBATC have partnered with industry and the community to address these needs. Technical and university training is allowing local residents to avail themselves of high-paying energy and energy-related jobs and fill critical needs in health care, teaching, and other public service jobs created by the growing population. Scientific research is providing information to overcome local challenges such as air quality, waxy crude transportation, and threatened and endangered species issues.

Education

Utah State University

USU takes its land grant mission seriously, striving to provide higher education opportunities and applied research benefits to the entire state. USU has maintained a campus in the Uintah Basin for more than 40 years. As oil and gas development and the Basin's population have increased recently, so has local demand for higher education. At the same time, growth in the extraction industry has intensified the need for research to address local challenges. To meet these and other demands, USU built the Bingham Entrepreneurship and Energy Research Center, a $23 million state-of-the-art research and teaching facility dedicated in 2010 (Figure 2). The Bingham Center was funded by philanthropists, the local community, and oil and gas industry revenues. Local government and industry revenues also provided an additional $20 million in associated infrastructure and roads.

Today, USU offers 38 degrees to the more than 1,000 students who attend the Uintah Basin campus. In particular, degrees offered in education and nursing are helping to meet local demand as the population of our area surges. The nursing program is a cooperative effort with UBATC and is supported by the local hospitals, Ashley Regional Medical Center and the Uintah Basin Medical Center. Boyd Edwards, Dean and Executive Director of USU's Uintah Basin Campus, serves on the Ashley Regional board of trustees, while Debbie Spafford, Public Relations Director for Ashley Regional, serves on the USU campus Advisory Board. This relationship has helped ensure that the training provided by USU is consistent with hospital needs, and is just one of the many examples of partnerships USU has formed to tailor educational offerings to local demands.

USU has invested in high-quality faculty and staff scientists who perform groundbreaking fundamental and applied research to understand and solve local problems. These scientists provide the students of our mostly undergraduate campus with hands-on learning and research opportunities that are usually only available to graduate students at large universities. USU Uintah Basin students have won prestigious research awards, and many of them have gone on to work for local companies and government agencies involved in oil and gas extraction.

Uintah Basin Applied Technology College

UBATC offers more than 30 educational programs in such areas as nursing, business, energy, and the trades. Training programs prepare skilled workers in welding, diesel mechanics, heavy equipment operation, truck driving, and construction trades. Over the past several years, UBATC has added specific training programs to further support the oil and gas industry: petroleum engineering, safety, and well-control, to name a few. The well-control simulator is the only full-size simulator in the western United States (Figure 3). Instructors are able to provide, through 3D simulations that animate down-hole

processes, the training required by industry for blow-out protection during extraction processes. This training is essential for protecting the health and safety of extraction workers and the environment. In addition to cutting-edge well-control equipment, UBATC also has an outdoor lab with actual oil and gas equipment—donated by the companies who benefit from the training—that provides hands-on instruction in the set-up, production, and completion of oil and gas wells and delivers true-to-life simulations of industry processes and safety procedures. The high quality of education and the local demand for trained employees ensures a 95% placement rate for students who complete UBATC programs.

Each program at UBATC is overseen by an advisory committee with members who represent employers in that occupational field. The committees make sure that training precisely matches workforce needs and that changes in technology, industry practices, and regulations are immediately reflected in the classroom. In 2013, these programs served more than 5,700 students, representing more than 160 companies nationwide. UBATC continues to maintain a strong reputation with industry.

Education + Opportunity = Prosperity

Industry, local government, and the Ute Tribe have provided millions of dollars in scholarships for Basin residents to attend USU and UBATC. These scholarships allow our Basin sons and daughters to attend college locally, and as a result more of them are staying in the Basin when they graduate, well prepared and energized to make their contribution to the local economy. Because of our high-quality educational institutions and an abundance of high-paying jobs, the Basin has one of the highest rates of income mobility in the country, according to the Equality of Opportunity Project (www.equality-of-opportunity.org).

Research and Innovation

Energy and Environmental Research at the Bingham Center

As we know, challenges accompany opportunity, and our area is not immune to the problems often engendered by growth and prosperity. In the Uintah Basin, USU performs research relevant to local concerns and provides information key to the wise decisions that must accompany sustainable economic progress. Currently, one of the biggest challenges to this progress in the Uintah Basin is wintertime ozone.

High ozone levels typically occur during the summer in large urban areas, and a decade ago no scientist or regulator had even imagined that ozone exceeding Environmental Protection Agency (EPA) standards was possible in rural areas during winter. Yet during the winter of 2009-10, as construction of USU's Bingham Research Center was drawing to completion, ozone concentrations exceeding EPA standards were measured in the Uintah Basin for the first time (the phenomenon was first discovered in the Upper Green River Basin of Wyoming in 2005). Community leaders in the Basin immediately engaged scientists at the Bingham Center to address the issue, and USU performed the first of many studies of winter ozone during the following winter (Figure 4).

Since then, a number of winter ozone studies have been carried out by our USU Bingham Center research team in collaboration with other organizations, including the National Oceanic and Atmospheric Administration, the Utah Division of Environmental Quality, and various universities. Unlike other research institutions, however, our team at the Bingham Center has strong ties with our local government and industry and is sensitive to local concerns and needs. We are deeply committed to our community, providing information about air quality to help elected officials navigate the issue, holding discussions with stakeholders about possible solutions, and engaging the public through media appearances, an informational website (ubair.usu.edu), and demonstrations for local students. Our children breathe Uintah

Basin air, and they benefit from the Basin's strong economy. We feel that it is our responsibility to safeguard environmental quality *and* economic prosperity for their sakes.

We believe strongly in collaboration and have formal relationships for cooperation in air quality research with Uintah County, the Ute Tribe, the State of Utah, the Bureau of Land Management, three exploration and production companies, and two oil and gas service companies. Each of these entities has different goals, but they all understand the need for improving air quality and sustaining the local economy, and that shared vision is our point of engagement with each.

The local community has provided about $2.5 million for air quality research at the Bingham Center and continues to be an invaluable partner, providing ongoing funding and ensuring the research agenda meets the needs of our community. Their strong support of air quality research has worked as leverage, allowing us to secure $1.3 million in air quality research funding from federal, state, and tribal agencies and from industry over the last two years, and we are now expanding our portfolio to include water quality, endangered species, and fuel chemistry research. The Utah Science, Technology and Research Initiative (USTAR) also provides support for our team. USTAR was established by the Utah Legislature in 2006 to support university research that leads to economic development.

We partner with local USU faculty in research projects, and we have employed 15 local students in research assistantships over the past two years. While the USU Uintah Basin campus offers several masters and one doctorate degree, the vast majority of students are undergraduates. Because we have access to few graduate students, undergraduates are integral members of our research team and perform tasks and gain experience traditionally reserved for graduate students. Several of our students have presented at national and regional scientific conferences, and one is preparing a publication for peer-review. Our students are gaining experience that is unavailable at large universities and unheard of at most other regional university campuses. They also interact closely with industry, giving them valuable connections for jobs after graduation.

We are committed to rolling up our sleeves and getting involved with stakeholders in solving local problems. This is the only way our research can have a strong impact on decisions made, and it is the best way we can pay back our community for its tremendous support.

Accelerating Innovation in the Uintah Basin

Our group is affiliated with USU's Commercial Enterprises team on the main campus in Logan, Utah, and we serve as a gateway to connect local entrepreneurs not only with patent and commercialization experts but also with research and scientific experts throughout Utah's university system. We recently launched the new Regional Innovation Gateway, a formal means by which Uintah Basin businesses and entrepreneurs can apply for and receive assistance to launch their ideas and commercialize their inventions (rd.usu.edu/htm/rig). We have assisted local innovators with technology development for oil shale and oil sands processing, produced water purification and reuse, and more.

We also carry out our own commercialization projects. We have obtained $300,000 in funding from the National Science Foundation to commercialize air quality measurement devices, and we intend to start a local company to build and market these instruments, further diversifying and strengthening the Uintah Basin economy. We are improving regulatory air quality computer models so industry and government can have better planning tools. We are also working with the University of Utah to find better ways to transport waxy crude oil out of the Basin for refining. In these and other efforts, our team is building the local economy through innovation.

Parting Word

Again, I wish to express my gratitude to Chairman Lamborn and the rest of the subcommittee for the opportunity today to share our story. I hope I have been able to convey effectively some of the ways that higher education institutions, community leaders, and industry are using the opportunities created by oil and gas production to improve the quality of life for residents of the Uintah Basin. I believe we have been successful because the leaders of our community have had the courage to be visionary, and because all stakeholders have been willing to work together to achieve that vision. Thank you.

Figures

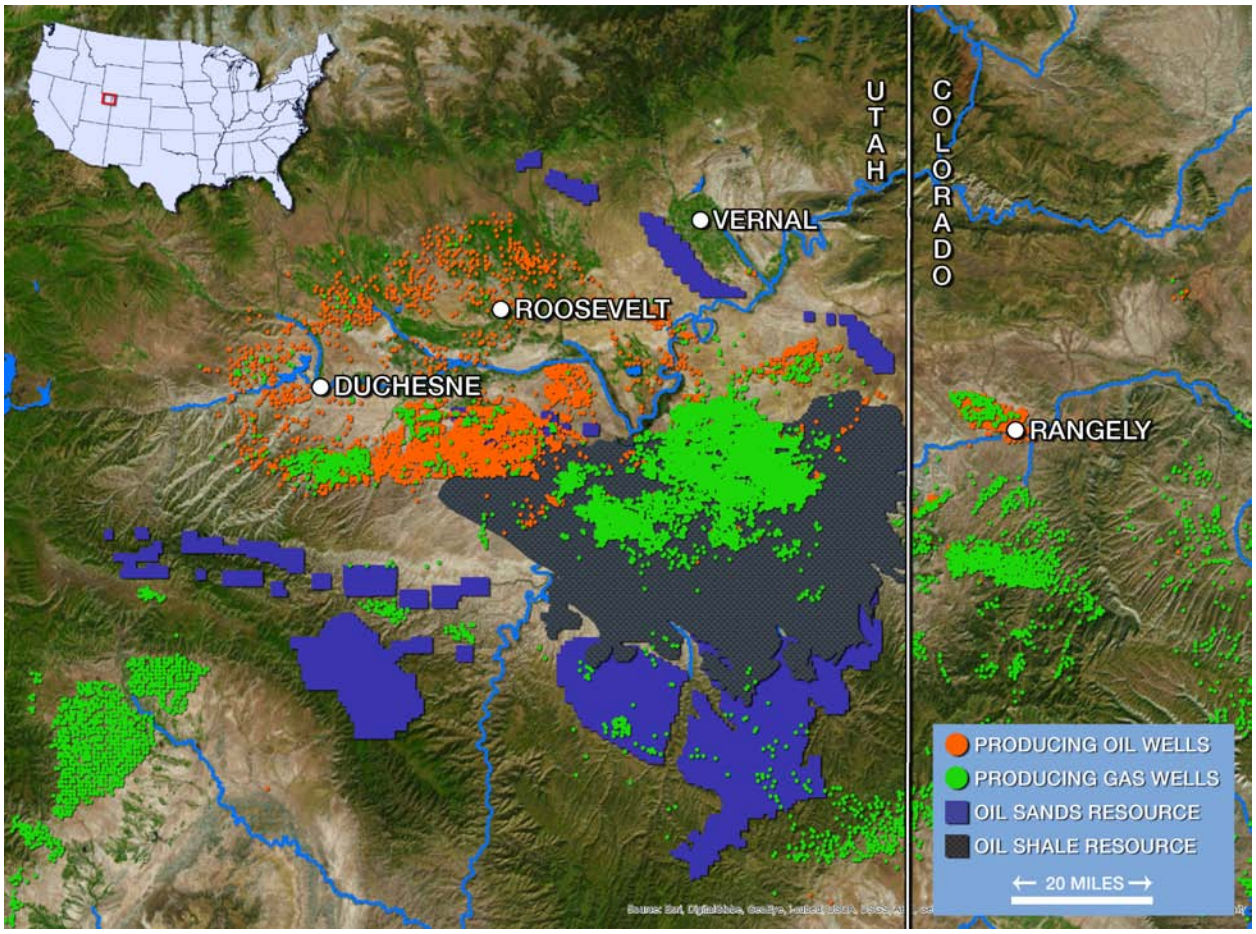

Figure 1. Fossil Energy Resources in the Uintah Basin of northeastern Utah.

Figure 2. The Bingham Entrepreneurship and Energy Research Center in Vernal, Utah.

Figure 3. Well control simulator at UBATC in Vernal, Utah.

Figure 4. USU students deploy an emissions measurement chamber on a produced water pond in the Uintah Basin.