

August 1, 2019—Written Testimony, Colorado’s Roadmap for Clean Energy Action: Lessons from State and Local Leaders—Chris A. Wright

Chairwoman Caster, Ranking Member Graves, and Committee Members, my name is Chris Wright. I am the CEO of Liberty Oilfield Services, which is headquartered in Denver, Colorado. We are a premier hydraulic fracturing services company. It is an honor and privilege to be here with you today to discuss Colorado’s state and local efforts to expand clean energy development.

The climate change issue is intimately tied to the energy sector, which I have spent my life working in. Over 35 years ago, I chose to attend MIT specifically to work on fusion energy. In graduate school at UC Berkeley, I worked on solar energy. After graduate school, I began my career as an energy technology entrepreneur working in geothermal energy and oil & gas.

Climate change is a global problem that requires a global solution. In our quest to reduce global greenhouse gas emissions, we must recognize the realities of the global energy market and the global economy. A rational global approach that balances climate mitigation, economic growth, and energy access objectives is required. Fortunately, Colorado’s oil & gas sector is well positioned to play its part in achieving all three priorities.

Energy matters. A lot. Throughout all of human history, global life expectancy was 30-35 years. In the last 200 years, global life expectancy has doubled. Extreme poverty has dropped from 90% of humanity to 10% and falling. The growth in human liberty and the dramatic increase in available energy are likely the two main catalysts for this tremendous progress.

Unfortunately, we still have a billion people in the world without electricity and 2-3 billion that still cook in the deadly fashion that our ancestors did: burning wood or charcoal indoors in open stoves which the World Health Organization estimates kills about four million people annually. Liquid Petroleum Gas, or LPG, is by far the most common replacement fuel (followed by natural gas) that allows clean and safe cooking while also saving women the more than an hour per day typically spent collecting wood, dung, etc. for cooking fuel. Energy poverty is the world’s greatest challenge.

As my background shows, I am for any and all energy sources as long as they are reliable, clean and affordable with the power to lift humans up. The enormous annual growth in global energy demand is driven predominantly by folks rising out of poverty, aspiring to lives like ours.

The U.S. shale revolution is aiding the poor abroad and in the U.S. via much cheaper oil and natural gas. Our shale revolution saves global consumers over one trillion dollars every year. Natural gas has become the number one source of electricity in the U.S., helping clean our air and being the largest factor in driving our CO2 emissions per person to a more than 50-year low!

The U.S.’ rapid transition from being the world’s largest importer of natural gas to the third largest exporter of Liquefied Natural Gas has driven down world natural gas prices, which in turn drives growth in global gas-powered electricity, dominantly displacing coal generation. This is a major force in shrinking, or slowing the growth of, greenhouse gas emissions. Globally, coal is still by far the largest source of electricity, followed by natural gas, hydropower, and nuclear. U.S. natural gas exports not only lower global greenhouse gas emissions via coal displacement, they also lower particulate matter, the world’s most dangerous pollutant, plus SOX, NOX, and mercury in both Asia and the U.S. as our western States are downwind of East Asia. In fact, a recent paper by an author at NOAA (National

Oceanographic and Atmospheric Administration) concluded that Asian air pollution was by far the biggest contributor to smog in the Western U.S.

Hydrocarbons provide a little over 80% of the world's energy, the same as they do in the United States. The US Energy Information Administration projects this dropping to only a little below 80% by 2040, but with a much larger drop in greenhouse gas emissions as the projections show continued displacement of coal with natural gas. Global energy consumption grew 2.3% in 2018 — think millions of folks rising out of poverty. Solar and wind combined supplied less than 2% of total global energy last year, or less than one year's INCREASE in global energy demand. Hence the current global trajectory of greenhouse gas emissions is impacted far more by the MIX of hydrocarbons — coal versus natural gas, for example — than the rate of growth in renewables.

One must also consider the emissions from the production of hydrocarbons. Flaring of natural gas and fugitive methane emissions are the main sources of production-related greenhouse gas emissions. It should not be surprising that both emission sources are dramatically lower in higher income / better infrastructure countries. Oil and natural gas produced in the United States results in lower emissions than oil and gas produced in Russia, Iraq, Mexico or virtually anywhere else. Further, oil and gas produced in Colorado has lower emissions than the U.S. as a whole, due to rigorous regulations on methane capture and very little gas flaring in Colorado. In fact, over the past eight years, Colorado's oil production has quadrupled at the same time as a nearly 50-percent drop in volatile organic compound (VOC) emissions from oil production. This is technology at work, coupled with the construction of new high-tech gas gathering infrastructure.

Demand for oil and natural gas is driven by consumers and is not impacted by the location of oil production. Take China, for example, which is the largest contributor to global oil demand growth, has double U.S. greenhouse gas emissions that are rising rapidly — up another 50 percent between now and 2030 under the Paris Agreement. However, China's domestic oil production is declining rapidly. Consumer demand or "pull" is what dictates total oil consumption. Regulatory regimes only impact WHERE oil is produced.

These facts lead to some counterintuitive conclusions, such as:

- Maximizing oil and gas production in the United States LOWERS global greenhouse gas emissions because of our modern and closely regulated domestic industry.
- Taking regulations too far, regulatory overshoot, is counterproductive. Inhibiting production in areas with lower emission profiles (cleaner production practices) leads to INCREASED global emissions as it simply moves oil production to less clean places. It also hands greater control of the global energy supply to countries that are hostile to the United States, such as Iran and Russia.
- Colorado to date has been a shining star, having extremely modern, low emission oil and gas production that has been growing and therefore displacing less clean oil production somewhere else.

- The same is true outside of oil and gas production. For example, the U.K. lowered their local greenhouse gas emissions by driving the petrochemical sector out of their country. But they did not lower global emissions, they simply relocated them.

In conclusion, I caution against exporting industry and jobs, while importing pollution. Climate change is a global problem that requires a global solution. Seeking territorial-based solutions that would keep U.S. fossil fuels in the ground would result in an increase in global emissions as dirtier producers would simply meet market demand. At the same time, such a climate policy would undermine U.S. national security interests to the benefit of Vladimir Putin and the radicals in Iran. Thankfully, Colorado's producers are amongst the cleanest in the world when it comes to the GHG profile of oil production. We should welcome their innovation; not punish it.

Thanks for hearing me out and I welcome any questions.