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Hearing of the Joint Economic Committee on

“The Economic Impact of Increased Natural Gas Production”

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Vice Chair Klobuchar and Chairman Brady, thank you for this opportunity to discuss with you and the other members of the Committee the economic impact of increased natural gas production.

Environmental Defense Fund is a national environmental advocacy organization with more than 750,000 members and supporters nationwide. We are dedicated to finding innovative approaches to solving some of the most difficult national and international environmental challenges. Whenever possible, we collaborate with private-sector partners, state and federal leaders, and other environmental organizations – including grassroots groups – interested in maximizing incentives for market-based solutions to environmental problems.

My testimony focuses on the real and substantial risks to public health and the environment associated with the rapid expansion of natural gas exploration and production activities in the U.S. If unaddressed, those risks will result in increased global warming pollution, harm to communities where gas development is taking place, and public opposition to the continued expansion of natural gas production and use.

The question before all levels of government -- federal, state, and local -- is whether the appropriate steps are being taken to implement and enforce the regulations necessary to minimize the risks. While there is evidence of progress in this area, it remains the case that the pace of increased natural gas development and use is outpacing the implementation of necessary protections.

Natural Gas Opportunities and Challenges

There is no question that unconventional gas development is lowering energy costs, creating new jobs, supporting more domestic manufacturing, and even delivering some measurable environmental benefits. For example, relative to coal, gas-fired electricity generation produces about half the carbon pollution, no sulfur dioxide or mercury emissions, and a small fraction of the fine particulate pollution common with the combustion of coal.

But as anyone who has lived next to or visited a well site can attest, unconventional natural gas development is heavy industrial activity, imposing significant public health and environmental risks on the communities where production takes place.

While there has yet to be conclusive evidence that hydraulic fracturing itself has caused drinking water contamination, it is well understood by industry and oil and gas regulators alike that poor well construction and spills of chemicals or wastewater at the well site, or in transit, can pollute streams and groundwater.

Because of intensive shale-gas development, the small town of Pinedale, Wyoming has experienced smog concentrations comparable to those of Los Angeles. And production activities in close proximity to homes, churches, and schools have turned once-quiet rural and suburban communities in Pennsylvania, Texas, Colorado, and elsewhere into industrial zones rife with constant noise, dust, and truck traffic.

Some gas enthusiasts downplay these environmental concerns, and characterize those citizens who raise them as alarmist. But they are wrong to do so. For champions of natural gas, the signs of public concern are ominous. Last fall, in a national poll, the Pew Research Center found that 49% of those surveyed opposed the increased use of hydraulic fracturing.

In Colorado, four cities in the heart of the Denver/Julesberg shale gas region have voted either for a moratorium on shale gas development or to prohibit it entirely. New York, one of four states under which the Marcellus Shale lies, has had a moratorium on shale gas development since 2010.

Achieving a true balance of interests is critical. The country can reap economic and environmental benefits from our burgeoning new gas reserves, so long as we ensure that public health and the environment are protected through strong regulation and enforcement. Striking the right balance also means continuing to invest in the deployment of energy efficiency and renewables even as our nation rushes to develop our new natural gas resources.

Whatever role natural gas may play in helping us to achieve energy security and carbon emission reductions in the short term – for example, through helping to integrate more renewables into the electric grid -- a sustainable long-term energy future depends upon shifting away from fossil fuels toward efficiency, renewables, and other zero-carbon energy technologies.

The Methane Problem

Though it burns cleaner than coal, un-combusted natural gas is mostly methane, a greenhouse gas 84 times more potent than carbon dioxide in the first 20 years after it is

released. Decisions made now about methane emissions will have a major impact on the rate at which the climate changes over the lifetimes of Americans spanning the next several generations. (For more details about the science underlying concerns about methane and other short-lived climate “forcers,” please see the attached article from Science magazine.) As natural gas exploration and production continue to expand, methane emissions threaten to cancel out the climate benefits that natural gas proponents often claim, especially with regard to the growing share of electricity generation fueled by gas.

Across our economy, the oil and gas sector represents 37% of U.S. methane emissions, the largest of all U.S. industrial sources, according to EPA. Estimates vary widely about how much methane is being leaked or vented during the production and transportation of natural gas.

EDF is actively working to better understand the magnitude of methane emissions across the natural gas supply chain, from well site through to delivery of natural gas to homes and businesses. Our effort involves over 100 different research universities and companies across the natural gas supply chain and will produce 16 different scientifically peer-reviewed studies. This, along with research efforts by other credible, independent institutions, will help us better understand the magnitude of the problem and opportunities for improvement.

While research is on-going, we already know enough to know that there is much that can and should be done. A recent cost analysis performed by experts at ICF, International – based on real data from industry -- found a striking opportunity for achieving dramatic reductions in methane emissions from the oil and gas sector. The study revealed that a *40% reduction in methane emissions from the sector could be achieved over the next five years at a cost of less than 1 penny per thousand cubic feet of gas produced*. Low-cost reductions of this magnitude would go a long way toward ensuring that the expansion of natural gas production will not be a net loss for the environment.

Moreover, according to ICF, methane emission reductions at this scale can be achieved using *current* technology. That is, most if not all, of the equipment and operational improvements needed to provide meaningful emissions reductions can already be found in the market.

Accordingly, in any discussion about the need, means, or opportunities for reducing methane emissions from the supply chain, there need be no debate about whether the equipment exists to get the job done. It does, and it is cost-effective to use.

The Case for Federal Action on Methane

It is reasonable to ask why, if methane emissions can be so cost effectively reduced, they remain a problem. Part of the answer is that methane reduction has not been a priority in an industry that has been allocating huge amounts of capital to acquire leases, explore for and produce new reserves, and build the treatment and transportation infrastructure necessary to get natural gas to markets. For local gas utilities, where public safety concerns bring heightened attention to natural gas leaks, financial constraints and state regulatory hurdles can slow or prevent the kind of actions (e.g., aggressive replacement of aging pipes) necessary to make environmentally meaningful methane reductions.

Therefore, we believe that state and federal action to require methane emissions reductions is needed now.

Current federal air emission standards for oil and gas operations apply only to a small subset of activities, and as the ICF study implies, expanded regulation could yield very large environmental benefits for a very small total cost.

At the end of March, the White House announced an interagency strategy regarding methane emissions across the economy, including oil and gas operations. As part of that strategy, the Environmental Protection Agency has issued five white papers for public comment pertaining to known methane emission reduction opportunities in the oil and gas sector. We expect EPA to make a decision on whether and how to regulate emissions from this sector later this year.

Likewise, the Administration's economy-wide methane strategy calls on the Bureau of Land Management (BLM) to take steps to reduce air pollution and methane emissions from production on federal lands. BLM has an obligation to be a good steward of our federal lands, which above all else requires them to take all steps to avoid waste of the resources that can be produced from them.

While our interest in reducing methane emissions is driven by environmental concerns, we note that every ounce of methane that is vented or leaked into the atmosphere or flared at the well site is a loss to our economy and our national energy security. The 40% reduction in methane emissions identified in the ICF Report is the equivalent of 54 LNG tankers worth of natural gas, every year. Surely, we all have an interest in putting an end to that kind of waste.

State Actions

When it comes to environmental regulation of oil and gas operations, states are not waiting for the federal government to act.

Wyoming, where air quality has been severely compromised in a portion of the state by rapidly expanding oil and gas operations, finalized new rules for the Upper Green River Basin, where production activities were contributing to ozone non-attainment as bad as

in some cities. The state's new program includes quarterly leak-detection-and-repair inspections for new and modified emission sources. About a week ago, Wyoming initiated another rulemaking that will apply similar requirements to existing sources.

In the area of water protection, Wyoming has also adopted some of the country's best requirements for groundwater testing around all new oil and gas wells: one baseline sample supplemented by two rounds of post-completion follow-up testing. The results are made public.

In Ohio, Governor Kasich supported changes to the general permit for oil and gas operations implementing leak-detection-and-repair program for volatile organic compounds from new, unconventional (hydraulically fractured) wells. Methane reductions will occur as a co-benefit of the rules. The Governor also supported chemical disclosure rules, which are now in place. Ohio is currently considering new measures that would further reduce methane.

In North Dakota, a state where new unconventional oil and gas development is transforming the economy, the massive amount of flaring of natural gas – which is both a waste of an important national energy resource and a significant source of air pollution in northwestern North Dakota – has attracted national attention. The state recently announced its intention to establish enforceable rules to crack down on unconstrained flaring.

In Pennsylvania, municipal water treatment facilities proved inadequate to handle the wastewater sent to them from hydraulic fracturing operations. Now, Pennsylvania has put an end to this practice, and toughened water quality rules, including creating a strong incentive for producers to conduct baseline water treatment before drilling. In addition, the state has adopted more rigorous air quality monitoring, stricter well construction standards, and tougher requirements for wastewater management. It is now beginning the process of strengthening those rules.

And earlier this year, Colorado put in place the nation's first and most ambitious set of rules designed to directly reduce all hydrocarbons -- methane as well as volatile organic compounds.

The rules require leak-detection-and-repair programs for all wells. The highest-emitting wells will be inspected monthly. Unnecessary venting during well maintenance will no longer be allowed. And so-called high-emitting valves will be replaced by low- or zero-emission valves. Existing storage tanks will have to meet new pollution limits as well as current federal limits applicable to new tanks. Altogether, the new rules will annually remove 100,000 tons of methane and 90,000 tons of smog-forming volatile organic compounds, equal to the emissions of all of the cars and trucks in Colorado today.

Collaborating to Build Knowledge, Improve Practices, and Establish Policy

EDF worked hard in support of the new Colorado rules, but we were not alone. Anadarko Petroleum, Encana, and Noble Energy – among the largest companies at the forefront of new oil and gas extraction in the Rocky Mountain West – supported the new rules as well. We worked closely with them and with the governor’s office to craft a strong, sensible approach to keeping more methane in the pipeline as product, instead of in the air as a pollutant. Indeed, recognizing the growing public concern about the environmental and public health impacts of oil and gas-related emissions, they helped make the case that reducing methane and volatile organic compounds could be done cost effectively, with no loss of jobs or productivity.

We have also partnered with industry in efforts to define best practices in the field. EDF was instrumental in helping launch a new collaboration known as the Center for Sustainable Shale Development (CSSD). Based in Pittsburgh, CSSD is designed to foster continuous improvement and innovation in shale gas development in the Appalachian Basin. CSSD’s board of directors includes oil and gas companies like Shell and Chevron, environmental leaders, leading scientists and academics, and former governors and cabinet members.

Regional centers of excellence like CSSD play an important role in spreading leading practices, but they are not a substitute for comprehensive regulatory approaches, and they have no authority to compel compliance with whatever standards they recommend.

Natural Gas and Renewable Energy

Stronger regulation of unconventional gas production and distribution is essential to protecting public health and the environment and maximizing the greenhouse gas benefits of natural gas relative to coal. However, even with the best regulations in place, natural gas is not a cure-all for climate change or the other environmental ills associated with coal; it is still a fossil fuel. To truly achieve a low carbon future, we will need a progressively cleaner mix of energy sources and strategies, including more renewable energy, demand response, and – the cheapest source of all -- energy efficiency. We must maintain our focus on maintaining and strengthening policies that are helping to develop and deploy the next generation of energy technologies even as our nation continues to develop its existing natural gas resources.

Conclusion

The shale gas boom has the promise of delivering valuable economic and environmental benefits to the country, but at least with respect to the environment, it is a promise not fully realized.

We see a near-term opportunity and need for federal action on air emissions, especially on methane, and we now know that the cost of such action would be minimal. The Colorado model described earlier provides a powerful example that can be drawn upon at the federal level to ensure that states and communities across the country receive a similar level of protection from volatile organic compounds, threats to water supplies, and, especially, the climate-related harm from methane emissions.

Our experience working with states gives us the confidence that there is a growing realization among progressive companies involved in various aspects of the natural gas business that the problems of methane emissions, as well as other air and water concerns, can and should be addressed.

Doing so will deliver multiple benefits to society while ensuring that America's new bounty of natural gas can not only advance our national energy and economic interests, but our environmental and public health interests as well.