

Natural gas drilling is at a crucial turning point

The industry must develop regulations that scale up drilling safely and learn from the mistakes made in the United States

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A Patterson-UTI Energy Inc horizontal drilling rig sits on a natural gas pad in Chartiers township, Washington county, Pennsylvania. Photograph: Andrew Harrer/Getty Images

First, a wave of new natural gas drilling swept across the US. Mountain and pastoral landscapes were transformed into landscape-scale factories that optimistically promised a century's worth of clean-burning fuel and a risk-free solution to dependence on imported oil. In 2008, it seemed the ultimate win-win in an era of hard choices.

Later, more sobering facts began to complicate things. The drilling relies on an invasive process called hydraulic fracturing or "fracking" that uses brute force and dangerous chemicals to crack open the Earth and extract the gas from previously unreachable deep deposits.

Where the drilling and fracturing happened, water wells sometimes became contaminated. Waste pits leaked into aquifers. Large quantities of fresh water were used. Mountain glaciers and Wyoming valleys became shrouded in smog. Reports began to emerge that natural gas might cause almost as much greenhouse gas pollution as coal.

Now, the industry is at a crucial point. Even as the hard lessons have come into focus, the myriad opportunities presented by this vast fuel source have made its development inevitable.

In the US, President Barack Obama stands firmly behind expanded natural gas use and the local economic development it brings. In the next 10 years, the US will use the

fracturing technology to drill hundreds of thousands of wells in cities, rivers and watersheds. Drilling – along with fracking – is fast expanding across Europe, South Africa and Russia. And it will not stop while oil prices are at record highs, the Middle East is in turmoil and nuclear energy is bogged down by global distrust after the Fukushima crisis.

The industry and governments need to figure out how to scale up gas drilling safely and how to learn from the mistakes in the US where the fracturing technology was first put to commercial use. The problem is that despite their head start, US scientists and regulators have not answered crucial questions about the risks.

Where will the vast amounts of water for fracturing come from and how will the waste water be safely disposed of?

Are regulations in place to make sure the industry extracts the gas as safely as possible and that underground sources of drinking water are protected?

And what, exactly, happens when bedrock is shattered and filled with chemicals deep underground?

It remains unclear, for example, how far the tiny fissures that radiate through the bedrock from hydraulic fracturing might reach.

Or whether they can connect underground passageways or open cracks into groundwater aquifers that could allow the chemical solution to escape into drinking water, as methane from these wells has been proven to have done.

And it is not certain that the chemicals – some, such as benzene, are known to cause cancer – are adequately contained by either the well structure beneath the Earth or by the people, pipelines and trucks that handle it on the surface. Almost no research exists into these issues.

Rather than learning from the environmental problems, the drilling industry has insisted they are not its fault. It maintains the fracturing happens thousands of feet from water supplies and below layers of impenetrable rock that seal the world above from what happens down below. There is no reason for concern, they say.

Yet there is. And the frequent cases of contamination and well control problems across the US that have come to light through several ProPublica investigations prove it. Even if layers of rock can seal water supplies from the layer where fluid is injected, the gas well itself creates an opening in that layer.

The well bore is supposed to be surrounded by cement, but often there are large empty pockets or the cement cracks under pressure. In many instances, the high pressure of the fluids being injected into the ground has created leaks of gas – and sometimes fluids – into surrounding water supplies..

This is partly why the US Environmental Protection Agency has undertaken a nationwide study into the lifecycle impacts of fracking, for the first time. The next step will be to use the findings to inform a rigorous system of oversight so drilling happens in the best, most technologically advanced and safest way possible.

In the US that is going to be tough, because the federal government does not regulate hydraulic fracturing. Oversight is left to states where regulations vary widely. Europe, where disparate governments oversee a shared continuous natural landscape, may face similar challenges. The energy industry already knows how to prevent water pollution and how to sharply reduce toxic air emissions, for example. Drilling companies have figured out how to drill wells with fewer toxic chemicals, enclose wastewater so it canIn the US, legislators are considering a baseline set of rules with higher standards which

would make fracturing slightly more expensive than the industry has wanted, but also offer an opportunity for consistency, predictability, and the streamlining of operations.

For places already coping with the environmental consequences of drilling, that will boost confidence that natural gas can be harvested safely. It will also lead to political and regulatory stability that will end up saving the industry money. And only then can drilling for gas be the win-win it was promised to be.

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