Press Briefing on Nature Energy Paper
May 3, 2023

Good afternoon. My name is Greg Upton. I am the Interim Executive Director and Associate Research Professor at the LSU Center for Energy Studies. Today I’ll be discussing a recently published paper, as well as ongoing research regarding orphaned and idle oil and gas wells, their costs to plug, and quantifying methane emissions coming from these wells. This written transcript will be provided to reporters.

This work is with coauthors including:

- Mark Agerton, at the University of California Davis
- Sid Narra, Brian Snyder, and Kanchan Maiti at LSU

I’d like to acknowledge the Center for Global Energy Policy at Columbia University and the Louisiana Department of Natural Resources for financially supporting some of the work being discussed today.

To start, I’ll discuss the recent paper titled “Financial Liabilities and Environmental Implications of Unplugged Wells for Gulf of Mexico and Coastal Waters,” published earlier this year in Nature Energy.¹

The question we ask is, “What are the costs to plug and abandon all wells drilled in water (including offshore and coastal waters) in the Gulf of Mexico region of the U.S.?” Although

¹ Nature Energy. Volume 8, pages 536–547 (2023)
offshore and coastal water wells account for less than 3 percent of all wells drilled in the U.S., over the past two decades, they have accounted for approximately 15 percent of all U.S. oil production.

Many states have orphan well programs. An orphan well is an unplugged well for which there is no financially viable company liable for oilfield site restoration work and for which the state has taken that legal responsibility. States maintain orphan well lists and have programs to plug these wells and conduct site restoration. The Infrastructure Investment and Jobs Act included $4.7 billion to plug orphan wells and conduct site restoration. Because states have had such programs for decades, states have experience with how much it costs to plug orphan wells on state lands.

But, oil and gas operations offshore and in coastal waters are more expensive. And state orphan well programs have plugged few wells in water. Thus, this recent peer-reviewed paper provides perspective on these costs.

**Results**

We identify approximately 82,000 boreholes drilled in the Gulf of Mexico or coastal waters in Louisiana, Texas and Alabama. Of these about 78 percent have been P&Aed. Another 8 percent are actively producing or being used for injection today. The

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2 *Nature Energy*. Volume 8, pages 536–547 (2023). See Table 1. Number of wells ever drilled in GoM.

3 Ibid. See Table 1: Wells by status. Includes Active and Active Injection wells.
residual 13 percent or so are inactive and are thus the most likely candidates for P&A work.⁴

We estimate the cost to P&A all of the 19,000 or so unplugged wells would be approximately 44 billion dollars.⁵ Of this, $30 billion in estimated costs (or approximately 68 percent) is for inactive wells.⁶ Thus, there is plenty of P&A work that can be conducted today that is unlikely to meaningfully impact oil and gas production.

We also break out results by federal deep water, federal shallow water, and state waters. You can find these breakdowns in the paper and more detailed transcript provided.

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Notably, about 78 percent of the estimated P&A costs are for wells in federal deep waters, with over 70 percent of those costs associated with wells being owned by a “supermajor” oil and gas company at some point in the past.⁷ Under current law, these supermajors are legally responsible for completing the P&A work.

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⁴ Ibid. See Table 1: Wells by status. Includes Temporary P&A, orphaned, Idle, shut in or inactive.
⁵ Ibid. See Table 3.
⁶ Ibid.
⁷ Ibid. See Tables 3 and 4.
Focusing on only inactive wells, we estimate $1.9 billion in costs to P&A all 7,000 inactive wells in state waters across Louisiana, Texas and Mississippi.\(^8\) For perspective, this amounts to approximately 41 percent of the IIJA funds. As I will discuss in a moment, states are focusing IIJA funds on onshore wells as they are significantly less expensive per well to P&A and are in closer proximity to people.

[continue verbal transcript]

The paper concludes with a discussion of environmental risks of unplugged wells, led by co-author Dr. Brian Snyder. A review of the relevant literature concludes that environmental risks of unplugged wells decline as wells are farther from shore and in deeper waters. For example, it is relatively unlikely that methane, a greenhouse gas, released from a deep-water wellhead will reach the surface.

Because wells in shallow waters are significantly less expensive to plug compared to deep-water wells, and their environmental risks are higher, one policy implication is that focusing work on wells closer to shore, and likely onshore wells, will provide more environmental benefits relative to costs.

This past year I have also been working with the Louisiana Department of Natural Resources assisting with both estimating the costs of plugging onshore orphan wells as well as estimating

\(^8\) Ibid. See Table 5.
methane emissions coming from these wells. This project is a natural extension from the previously discussed peer-reviewed paper.

We have a team of field research assistants, under the direction of Dr. Kanchan Maiti, who are taking detailed measurements of methane potentially leaking from these wells. These detailed chamber-based measurements are compared with less detailed, and less expensive, flow measurements conducted by contractors hired by DNR to provide state-level estimates of total methane emissions from orphan wells, as well as assist the state in prioritizing wells to maximize the emissions reductions for a given cost.

This work is in the beginning phases, but preliminary results are as follows:

First, and as anticipated, offshore wells are significantly more expensive to plug than onshore wells. Second, emissions are highly right-skewed—meaning that approximately three-fourths of the wells do not have detectable levels of methane being emitted when less expensive flow-based contractor measurements are taken, and that the top one percent of wells accounts for approximately half of the emissions. Thus, if emissions reduction is the only policy objective of this program, one strategy would be to measure as many wells as possible, spending more on measurement, and targeting emitters. Of course, the tradeoff in this approach is that fewer wells would be plugged with the program. Also, there could be economies of
scale of plugging multiple wells within the same geographic area that would be foregone with a more targeted approach.

In coming months, we will have a sufficient number of detailed chamber measurements to begin comparing measurements from different techniques and provide estimates of emissions across all of the states’ orphaned and idle wells. We hope these results will contribute to our understanding of the lifecycle emissions of oil and gas activity, as well as assist the state in running its oilfield site restoration program efficiently.

Thanks for your time, and I look forward to more discussion.