
Lemons to Lemonade: Funding Clean Energy Innovation with Offshore Drilling Revenues

BY MATT HOURIHAN | JULY 2011

The most pressing need for clean energy innovation is public investment, but this has been hard to come by in a time of fiscal austerity. Fortunately, the economic value of the nation's offshore oil and gas resources could offer a substantial revenue stream for exactly the investment we need.

With the Administration's recent easing of drilling opposition and continuing support from Congress, the nation appears to be heading again towards expanded offshore drilling. The limitations of drilling are well-documented, from the prolonged reliance on fossil fuels, to the increased environmental risks, to the limited impacts on gasoline prices. Perversely, the expansion of drilling comes at a time when policymakers see investments in clean energy innovation as an expendable sacrifice in the name of deficit reduction. Drilling on the outer continental shelf (OCS) is inadvisable on its own. Compounding it with starving energy innovation is worse. Only one of these sectors offers long-term economic upside, massive social returns to investment, and export potential, and it's not oil.

Nevertheless, the more socially desirable goal—the transition to clean energy—could directly benefit from the less desirable goal of drilling. The most pressing need for clean energy innovation is public investment, but this has been hard to come by in a time of fiscal austerity. Fortunately, the economic value of the nation's offshore resources could offer a substantial revenue stream for exactly that investment we need, so long as policymakers are willing and able to harness it, as they occasionally have in a bipartisan fashion in the past. In other words, if we have to drill, we should leverage it to make it work for clean energy.

There are many ways to tap the OCS for revenue and put it to good use. One logical step, of course, would be to roll back tax subsidies benefiting oil and gas extractors. But this step has foundered of late. Other smart steps would include increased drilling fees or higher

minimum bonus bids, with increased revenues dedicated to clean energy innovation programs. But one step that should receive greater attention is increases to the royalty rate itself, an idea that has received favorable attention from the Obama Administration. Just a five percentage point increase in the offshore royalty rate could produce an additional \$2 billion in revenues—and potentially much more—in the coming years. Current rates are below those in many other industrialized countries, and increasing royalty rates would enable the United States to harness the economic value of fossil fuel reserves for direct clean energy investment. But if we are to raise royalty rates, any increased revenues should be dedicated by Congress specifically towards clean energy innovation, perhaps by establishing a trust fund similar to the other public funds that currently receive drilling revenues.

To be clear, raising royalties on new drilling activity is not a short-term revenue solution, but if it were coupled with more short-term revenue streams from drilling activities, over time it could nevertheless provide a long-run, steady funding stream for clean energy investment.

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THE NEED TO BOOST CLEAN ENERGY INNOVATION INVESTMENT

Accelerating the development and adoption of clean energy technology requires increased investment in innovation, but energy has historically been one of the least innovative economic sectors in the country. One of the most notable trends has been the long-term decline in private energy R&D. As documented by J.J. Dooley for the Pacific Northwest National Lab, private sector R&D spending—including for both clean and dirty energy—reached its peak thirty years ago.¹ A study commissioned by Battelle and *R&D Magazine* finds that domestic private sector R&D investment now stands at just over \$3 billion, roughly half of its peak.² This is partly due to the fact that energy tends to be far less research-intensive than many other more innovative sectors such as IT, pharmaceuticals, or chemicals.³

Further highlighting the private clean energy investment shortfall is that many firms place their largest emphasis on fossil fuel development. As Dooley writes, “It is clear that fossil energy R&D—particularly core oil and gas production and refining R&D activities supported by the oil and gas industries—was a dominant focus of the U.S. private sector’s support for energy R&D over the period 1973–2005, representing more than half of the cumulative private sector investment.” Dooley adds that major energy producers “have started to devote up to one-quarter of their overall energy R&D effort to what is broadly categorized by the Energy Information Administration (EIA) as ‘other nonconventional energy R&D,’ implying that up to 75 percent of these firms’ energy R&D effort is still unsurprisingly focused on their core business activity of finding, producing and refining petroleum and natural gas.”⁴

It’s a similar story for public funding for innovation. According to ITIF’s Energy Innovation Tracker, the federal government is currently investing more than \$4 billion in clean energy innovation, again approximately half of the thirty-year-old peak, and even less as a share of overall GDP. This sum is dwarfed by R&D expenditures in other areas, particularly defense and health. Persistent domestic underinvestment, a track record of massive social returns on innovative investment overall, and the rise of clean tech tigers in

Asia and elsewhere have led many leading thinkers and business leaders to call for a tripling of such investment. The need for more investment is great, yet many policymakers are moving in the wrong direction, with budget proposals that would gut exactly those investments. In the face of the nation's current budget challenges, drilling revenues could fund a slice of the needed investment.

WHAT DRILLING CAN AND CAN'T DO

The outer continental shelf (OCS) drilling debate is subject to a long-held myth: that abundant oil and natural gas, if only allowed to flow forth, will drive down energy prices, while allowing the nation to “stick it” to oil-exporting nations in volatile regions. Yet drilling is unlikely to achieve these ends. Oil is a commodity with prices set on the world market, and increased domestic output won't have a significant impact. The United States currently consumes roughly nineteen million barrels of petroleum products per day, while producing around six million barrels of crude domestically (less than 10 percent of the global supply). About a third of this domestic production comes from the OCS. While substantial OCS reserves do exist, relying on domestic reserves to offset our petroleum imports would require more than doubling total domestic production—a difficult and likely impossible task, due to technical challenges and long development times. In the words of Boston University's Robert Kaufmann, “Whoever talks about oil independence has to tell a story about how we close a 15-million-barrel gap.”⁵

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For perspective, the EIA has estimated that expanded access to offshore resources would boost domestic production of oil and gas by just a few percentage points.⁶ And in the most recent Annual Energy Outlook, the EIA estimated that even if the amount of technically recoverable oil and gas is three times as high as expected, it would still only yield an extra million or two barrels per day at its peak, and not before the next decade. This is in line with previous estimates from Chevron president Gary Luquette, among others.⁷ As the EIA says, “In most areas, depending on location and water depth, a period of 3 to 10 years for exploration, infrastructure development, and developmental drilling is required from lease acquisition to first production.”⁸ Unsurprisingly, the EIA finds that these amounts, relatively small in relation to total global production, would have virtually no impact on energy prices: in the best-case scenario they might shave off perhaps a few cents per gallon by 2035.

So OCS resources can't provide a panacea for America's energy cost woes, and nor does drilling hold the long-run economic growth or export potential of clean energy—but they *can* provide a source of publicly-owned economic value. EIA estimates undiscovered, technically recoverable resources at 70 billion barrels of oil and 350 trillion cubic feet of natural gas in both open and closed areas; the Minerals Management Service (MMS, now the Bureau of Ocean Energy Management, Regulation and Enforcement, or BOEMRE) has produced higher estimates, at 85 billion barrels and 420 trillion cubic feet, though uncertainty surrounds these figures. Most of these reserves are in areas already open to leasing activities. Estimating the total economic value of these resources can be a perilous endeavor indeed, as it largely depends on assumptions about future fuel prices, but applying assumptions of \$100 per barrel oil and \$5 per thousand cubic feet of natural gas—both realistic long-run assumptions—would imply an overall value in the trillions.

Expanded drilling is fraught with challenges, highly problematic from an environmental perspective, and will have minimal impact on current energy prices — but raising royalties could have significant long-run upside in revenues that could be reinvested in clean energy innovation.

Of course, only a portion of this value would be available for federal revenues, and over the course of decades. Offshore revenue is generated through three mechanisms: bonus bids from potential lessees, rents while exploration is underway, and royalties collected based on the volume and price of oil and gas sold. The rate for royalty collection is 18.75 percent in the Gulf of Mexico and 12.5 percent in most other areas. Of the revenues that are collected, portions are distributed by statute to the Land and Water Conservation Fund, the National Historic Preservation Fund, and to the state revenue-sharing for drilling in federal waters nearest the coasts. In FY 2010, the Office of Natural Resources Revenue reported total offshore royalty revenues of \$4 billion (with an additional \$1.2 billion from bonus bids and rents). These figures are roughly consistent in magnitude with prior years over the past decade with the exception of FY 2008, an outlier in which royalty revenues surpassed \$8 billion. It's worth noting that these don't include revenues from drillers receiving royalty relief exemptions, an amount that could add up to billions.⁹ It's also worth noting that the United States collects a lower share of revenues from drilling activities in federal waters than many other nations and U.S. states, as the Government Accountability Office has said following a survey of prior studies. For example, a 2002 study found that the Gulf of Mexico deepwater take ranked lower than the deepwater take in 54 fiscal systems in other nations, including India, Brazil, China, and Australia. A more recent MMS study in 2006 found similar results.¹⁰

It is therefore appropriate to consider an increase in royalty rates to achieve parity with other producers elsewhere, and the Administration should consider this step soon. The Secretary of the Interior is able to raise royalty rates unilaterally, but this is only the first step. The second step is one for Congress: to establish a clean energy innovation trust fund that invests in radical new technologies, and ensuring that new revenues are dedicated to this fund alone. This clean energy innovation trust fund would thus exist alongside the Land and Water Conservation Fund and others that receive offshore drilling revenues.

So what would, say, a five percentage point royalty rate increase on new drilling activities mean? The assumptions above would suggest increased revenues of over \$400 billion in the aggregate, though this may be an overestimate given reduced drilling activities due to lower economic returns. However, this aggregate figure would be spread over many years. It's unclear how much additional revenue per year it might yield given uncertainties around drilling potential and turnover, but an expansion of a million extra barrels per day and a trillion extra cubic feet of gas—again, reasonable estimates for expanded drilling activities—would yield additional revenues on the order of \$2 billion per year under the five percentage point rate increase. Over time, as new leases with the higher rate replace older leases, total additional revenues could reach a few billion more, especially if royalty relief is no longer in the picture.

An offshore royalty rate increase on new leases is not the ideal solution for generating revenue for clean energy investment, however. As mentioned above, it takes years for new leases to begin generating production and, thus, royalties; but clean energy investment is needed now. Thus, it may make sense to couple a royalty rate increase with a boost in minimum bid requirements or other fees that would yield more immediate revenue gains. And to be perfectly clear: the scale of the energy investment challenge is such that these

amounts are unlikely to meet it fully. Investment of not billions, but tens of billions is needed. Nevertheless, drilling revenues could make a substantial long-term contribution to the investment effort, and in turn help us move towards a more energy independent economy.

WHAT ABOUT REVENUES FROM ONSHORE DRILLING?

Substantial fossil energy reserves exist onshore as well. Under the Energy Policy and Conservation Act Phase III Inventory, the Department of the Interior has estimated 31 billion barrels of oil and 231 trillion feet of natural gas—far less than offshore, but still substantial. Unfortunately, while onshore leases tend to reach production faster than offshore leases, the vast majority of those revenues are already designated for state revenue sharing and the federal Reclamation Fund. A rate increase or other measures would have to take these into account, and may have to be decoupled from prior revenue-sharing commitments.

Lastly, while oil shale is often looked upon as the mother lode of fossil energy reserves, with the potential for hundreds of billions of recoverable barrels of oil in the Green River Formation alone, this industry is still decades away. The RAND Corporation has estimated that a domestic oil shale industry will only begin to produce one million barrels per day in twenty years, if not later.¹¹ The need for immediate investment in clean energy makes oil shale an unlikely and unattractive revenue source.

CONCLUSION

Expanded drilling is fraught with challenges, highly problematic from an environmental perspective, and will have minimal impact on current energy prices—but increased royalties could provide badly needed support to supplement federal investment in clean energy investment. If all avenues for leveraging these revenues are pursued, it would be feasible to see at least two billion dollars per year over the next decade that could be dedicated to investment in clean energy innovation. These revenue levels would admittedly be inadequate to fully meet the clean energy investment challenge, and may be particularly limited in the short run, but nevertheless would make an important contribution.

ENDNOTES

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