America's Oil and Gas Supply:

"American Innovation Creating American Energy, American Jobs, and American Wealth"

A Roadmap to America's Oil and Gas Resources

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Report from the Republican Committee on Natural Resources Staff
Rep. Don Young, Alaska, Ranking Member

"Let us develop the resources of our land, call forth its powers, build up its institutions, promote all its great interests, and see whether we also, in our day and generation, may not perform something worthy to be remembered." – Daniel Webster

This Webster quote is engraved in the marble above the Speaker's Dais in the House of Representatives. Never in our nation's history have the words, "Let us develop the resources of our land" been more poignant than today as Congress holds the keys that could open our domestic energy resources and free us from the yoke of foreign energy.

Never in our nation's history has the importance of "build up its institutions" been more important than today when the U.S. House of Representatives is being torn down by parliamentary tactics to deny a clear Majority of Congress the right to vote on energy legislation.

This report will provide the roadmap of technology, resources, and prospects for American energy development creating more American Energy, more American Jobs, and more American Wealth.

I. Executive Summary

The great resources of the United States have powered our nation since its inception. Today, when our nation faces the growing challenge of maintaining our standard of living in an ever more competitive world, we can no longer wait to develop our domestic resources. This report will communicate the facts about what and where America's oil and gas resources are, into a simple conversational document answering the questions Americans are asking. **The United States is a nation rich in oil and gas resources and as the chart below shows, just the oil and gas discussed in this report could supply America more than 178 years of oil and 495 years of natural gas.**

This report is broken into 3 sections: American Resources, American Innovation, and American Opportunity.

American Resources will focus on the conventional oil and gas we are currently developing, hold in reserve, and have in undiscovered technically recoverable resources both onshore and offshore.

American Innovation will examine the new technologies that have opened what were unconventional resources making what was long thought unavailable a conventional resource.

Source of American Energy	Millions of Barrels of Oil	Billions of Cubic Feet of Natural Gas
Known U.S. Reserves		
Total US [1]	20,972	651,917
Undiscovered Technically Recoverable Resources From Conventional Technology		
Federal Offshore [2]	85,880	419,880
Federal Onshore [3]	24,200	214,100
State and Private Onshore [4]	17,800	146,900
Future Development		
Tar Sands [5]	11,000	
Improved Enhanced Oil Recovery [6]	127,000	
Oil Shale [7]	1,000,000	
Methane Hydrates [8]		10,000,000
Total	1,286,852	11,432,797
American Annual Consumption [9]	7,201	23,057
Supply at Current Rates	**178 YEARS**	**495 YEARS**

Finally, American Opportunity will examine what the future could hold if America is willing to reach out by developing our own domestic sources and advancing American technology.

[1] From Energy Information Administration (www.eia.doe.gov)
[2] Figures from Minerals Management Service Testimony
[3] Figures from Bureau of Land Management EPCA Phase III Study (http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/EPCA_III.html)

[4] Figures from USGS "Mean Conventional Oil Resources" (http://certmapper.cr.usgs.gov/data/noga00/natl/graphic/2007/mean_conv_oil_07.pdf)
[5] DOE – Office of Petroleum Reserves (http://www.fossil.energy.gov/programs/reserves/index.html)
[6] DOE – Office of Fossil Energy Report "Game Changer Improvments could dramatically increase domestic oil recovery efficiency" (http://www.fossil.energy.gov/)
[7] Figures from DOE – Office of Petroleum Reserves (http://www.fossil.energy.gov/programs/reserves/index.html)
[8] Figures based on 5% recovery of the low resource figure (200,000 Tcf) from USGS – Actual recovery rates or actual resource may be significantly higher than this conservative estimate.
[9] Figures from Energy Information Administration, DOE (www.eia.doe.gov)

American Resources – Domestically America's oil and gas resources are plentiful and unavailable. Only 3% of America's federal offshore and 6% of America's federal onshore lands are available for development. Moreover, due to Congress' historic willingness to lock away our domestic energy we do not exactly know what we have in reserve.

Offshore, on our Outer Continental Shelf (OCS) according to testimony last year from Walter Cruickshank, Acting Director, Minerals Management Service (MMS), "the Outer Continental Shelf (OCS) inventory requirements of the Energy Policy Act of 2005, MMS completed an assessment of the potential quantities of undiscovered technically recoverable oil and gas resources that may be present on the OCS. According to this assessment, we estimate (at the mean level) that the **OCS contains 86 billion barrels of oil (as oil and natural gas liquids/condensate) and 420 trillion cubic feet of natural gas**."[10] Of these amounts an estimated **18 billion barrels of oil** and **76 trillion cubic feet of natural gas**[11] have been left undiscovered in off-limits portions of the OCS.

Our **onshore** resources are equally rich; our undeveloped oil resources under our onshore **Federal lands total 30.5 billion barrels of oil,**[12] comprising 24.2 billion barrels of undiscovered technically recoverable resources and 6.3 billion barrels of reserves growth. Most of this is under the lands of Alaska, however there remain some significant resources under the lower 48 states. Equally important, are the rich undeveloped natural gas resources under our Federal lands which total **231.0 trillion cubic feet**[13], comprising 214.1 trillion cubic feet of undiscovered technically recoverable resources and 16.9 trillion cubic feet of reserves growth. A significant portion of these resources lie on federal lands in the Rocky Mountains.

American Innovation – All across America today we are seeing advancements in technology that are opening resources which we have known about, but have been unable to develop. Bakken Shale, Tight Sands Gas, Deepwater Gulf of Mexico, and Tar Sands are all resources which a decade ago seemed out of reach. Today with our technology developments we are opening these new sources to bring more domestic oil and gas online.

The Bakken Shale, which under lies Montana and North Dakota, has been known since the 1950s but has been undeveloped due to the technological challenge of developing the resource. Modern advancements have opened this resource and today estimates range from **4 to 12 billion barrels of oil**[14] could be recovered from this "new" domestic energy source.

Tight Sands Gas is another "new" resource, yet already names like Barnett Shale, Piceance Creek, and Appalachian basin are springing to mind as development in tight gas fields increase the

[10] From Testimony of Acting MMS Director, Walter Cruickshank, before the House Committee on Natural Resources, June 28, 2007
[11] Ibid
[12] BLM EPCA Phase III Study
[13] Ibid
[14] National Assessment of Oil and Gas Fact Sheet, Assessment of Undiscovered Oil Resources in the Devonian-Mississippian Bakken Formation, Williston Basin Province, Montana and North Dakota, 2008 (http://pubs.usgs.gov/fs/2008/3021/)

supply of domestic natural gas. Today, tight-gas sands now account for about 19% of U.S. production and the U.S. Geological Survey estimates tight-gas sands and shales may contain up to **460 trillion cubic feet (Tcf)** of gas[15] in the U.S. alone.

Tar Sands are a combination of clay, sand, water, and bitumen, a heavy, black, asphalt-like hydrocarbon. The largest deposits are found in Utah (almost 30 billion barrels), Alaska (almost 20 billion barrels), Alabama (more than 6 billion barrels), and Texas and California (5 billion barrels each). Bitumen from tar sands can be upgraded to synthetic crude oil and refined to make asphalt, gasoline, jet fuel, and value-added chemicals. U.S. tar sands resources are estimated at 60 to 80 billion barrels of oil in place, with an estimate of at least **11 billion barrels recoverable.**[16]

Deepwater Gulf of Mexico (GOM), which the Minerals Management Service (MMS) defines deepwater as deeper than 1,312 feet (400 meters), and ultra-deep water as deeper than 5,249 feet (1,524 meters). The first deepwater production in the GOM took place in 1979, but it took until 1992 before more than 10% of the oil production in the GOM was in the deepwater, and until 1998 before more than 10% of the natural gas production in the GOM was in the deepwater. By 2006, those percentages had increased to 72% for oil and 38% for natural gas. This dominance of deepwater production in the Gulf of Mexico will continue and has recently attracted approximately $3.7 billion in high bonus bids for the federal government.[17]

American Opportunity, Oil Shale - Could America have more oil supply than Saudi Arabia? Possibly if we can unlock our oil shale resources! America is the world's leader in oil shale, the richest deposits are in the Green River Formation in Utah, Colorado, and Wyoming. America's oil shale resources could exceed 6 trillion barrels of oil equivalent. As much as **1 trillion barrels of oil** [18]could be recovered economically at today's prices with today's technology.

Methane Gas Hydrates, may be the most important resource that many American's have never heard of trapped, are off the coasts. Gas hydrates are ice-like crystalline substances occurring in nature where a solid water lattice accommodates gas molecules (primarily methane, the major component of natural gas) in a cage-like structure. Gas hydrates form in the shallow subsurface along continental margins in the outer Continental Shelf and below the permafrost in polar regions, where pressure and temperature conditions provide a zone of hydrate stability.[19] Gas hydrate resources may be one of the Nation's most promising energy supply sources. The U.S. Geological Survey (USGS) notes that if one percent of the expected in-place resource can be accessed (1% of 320,000 trillion cubic feet); the Nation

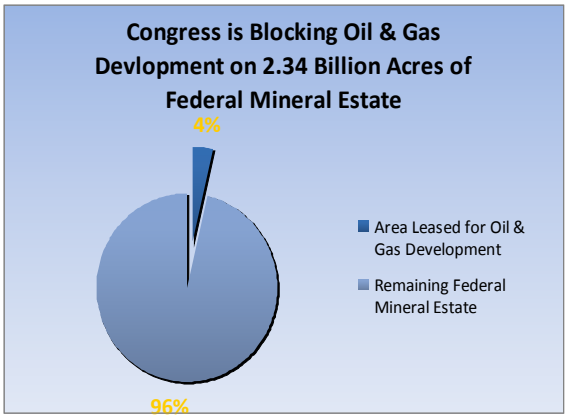
[15] Data from USGS "US Natural Gas Availability" (www.usgs.gov)
[16] DOE – Office of Petroleum Reserves
[17] MMS Central Gulf of Mexico Lease Sale 206
[18] Data From USGS and Department of Energy
[19] "Preliminary Evaluation of In-Place Gas Hydrate Resources: Gulf of Mexico Outer Continental Shelf", Executive Summary, OCS Report MMS 2008-004, February 1, 2008.

could more than double its technically recoverable natural gas resource base (currently estimated at 1,200 trillion cubic feet).[20]

V. Ending – Simple Choices

The development of a greater domestic American energy supply is critical to freeing America from our dependence on foreign energy. While many in Congress can call the expansion of drilling for oil and natural gas in the Outer Continental Shelf a "hoax" the truth is that America has rich oil and natural gas reserves. As shown in the opening graph in this report, our supply of both conventional oil and natural gas and the future development of tar sands, oil shale and methane hydrates can supply America with steady energy for hundreds of years and many generations to come.

The question isn't can America develop these resources, this report has shown that time and time again, America can take the unconventional resources of the past and develop the technology to harness them for the future.



The real question is WILL America develop these resources? Will we have the courage to push forward with the development of oil shale? Will we open the OCS for conventional oil, gas, and methane hydrates? Will we choose to free ourselves and develop our own domestic oil and gas resources? This choice isn't however just about energy, the choice is will we create good American manufacturing jobs building the infrastructure to harness this energy.

Will we choose to direct the $700 billion we spend each year on foreign energy to creating American energy? Each productive new lease brings hundreds of jobs to Americans, when multiplied by the thousands of productive new leases, we could have a renaissance of American domestic manufacturing.

Finally, this new production brings with it financial rewards as well. Since a majority of these resources sit on federal lands, the federal and state governments will share in the wealth, not just through royalties and rents, but through payroll and income taxes, increased business development, and a stronger US dollar. This revenue flow to the states will bring greater benefits in education, transportation and health care for every American family. We can free America from foreign oil, we can free America from foreign natural gas, we can invigorate America's economy, by harnessing American innovation to create more American made energy with American jobs and build a future on more American wealth.

[20] "MMS Report to Congress: Energy Policy Act of 2005 – Section 353(e) Gas Hydrate Production Incentive Review", August 2006, page 1.