

# Unaccounted Carbon Costs Pushing America into the Red



**FOSSIL FUELS PRODUCED FROM INTERIOR DEPARTMENT-MANAGED LANDS AND WATERS COSTING U.S. BILLIONS**



A report from WildEarth Guardians'  
Climate and Energy Program  
July 22, 2014



### **MISSION STATEMENT**

WildEarth Guardians protects and restores the wildlife, wild places, wild rivers, and health of the American West.

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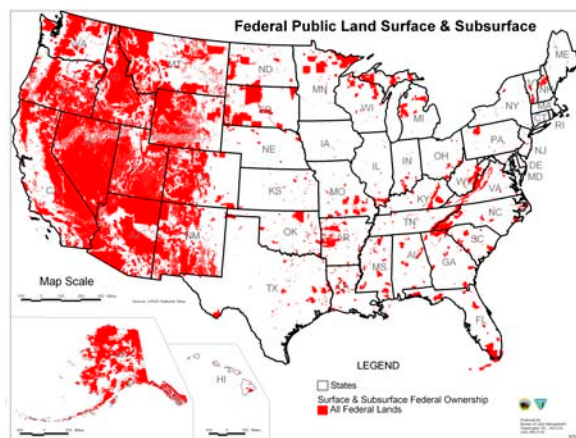
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Front image: Matthew Brown, Associated Press.

## EXECUTIVE SUMMARY

The United States Interior Department is responsible for the management of most lands and minerals in America. Its management authority extends to one-fifth of all land in the United States and millions of acres of minerals, including oil, gas, and coal. Its authority extends to vast amounts of offshore oil and gas, more than 570 million acres of coal reserves, and more than 36 million acres of oil and gas reserves currently under lease.<sup>1</sup> Through its agencies, the U.S. Bureau of Land Management, Bureau of Ocean Energy Management, Office of Surface Mining, Reclamation, and Enforcement, Bureau of Indian Affairs, and others, the agency oversees a massive amount of fossil fuel energy minerals.

Recently, the Department released its annual report on the economic contributions of its management activities. Although this report highlighted the fact that the Department's vast amounts of public lands provide enormous economic benefits due to their recreational, conservation, and other natural values, the Agency also asserted that its fossil fuel energy management--i.e., its facilitation of the extraction and sale of oil, gas, and coal--has reaped Americans billions of dollars in economic benefits.



**Federal land and minerals in U.S.  
(excluding offshore).**

Unfortunately, the Interior Department's estimate of the benefits of its fossil fuel energy management lacks any actual consideration of the costs of oil, gas, and coal to America. Notably, Interior's assessment of benefits lacks any consideration of the costs of carbon pollution associated with the production and ultimate consumption of oil, gas, and coal.

Methods utilized by the federal government to assess the social cost of carbon indicates costs of oil, gas, and coal produced from Interior Department-managed lands and waters are enormous and may outweigh the benefits reported by Interior. A simple assessment based on the federal government's own methods indicates that nearly \$200 billion may be lost annually because of carbon. This conclusion is bolstered by the fact that oil, gas, and coal development release large amounts of methane, a potent greenhouse gas.

The U.S. Department of Interior cannot continue to quantify the benefits of the fossil fuel energy development it oversees without accounting for carbon costs. With President Obama calling for action to combat climate change, the Interior Department's latest economic contributions report firmly undermines efforts to curtail carbon.

For the American public, the Interior Department must start to take into account the carbon costs of its fossil energy management. Only an honest assessment of costs can truly reaffirm the economic benefits provided by the US. Interior Department's management of public lands and minerals.

## INTRODUCTION

On July 11, 2014, the U.S. Department of Interior released its Economic Contributions Report for FY 2013, reporting revenue from its public lands and minerals management. Among the sources of revenue, Interior touted fossil fuel development from public lands and waters.<sup>2</sup>

Although recognizing that this development poses external costs, the report made no effort to quantify such costs, instead highlighting only benefits from oil, gas, and coal sales and indirect economic benefits. In the report, Interior states:

- **Fossil Fuel Energy:** In FY 2013, Interior-managed lands and waters produced 652 million barrels of crude oil, 4 trillion cubic feet of natural gas, and 420 million tons of coal. Some average prices in FY 2013 included \$101/bbl for oil, \$3.72/mcf of natural gas, and \$11 per ton of Powder River Basin coal. Oil, gas and coal produced from Interior lands were estimated to provide value added of \$121 billion; estimated economic output contribution of \$220 billion; and an estimated 1 million jobs. External costs are associated with the development of oil, gas, and coal produced from Interior lands, and with the production and the use of these resources. Market prices do not fully reflect these costs. Various regulations and other requirements designed to minimize adverse environmental impacts internalize some (but not all) of these external costs.

The climate costs of this oil, gas, and coal, however, are quantifiable using the social cost of carbon protocol.<sup>3</sup> The Social Cost of Carbon protocol was developed by numerous federal agencies and, according to the U.S. Environmental Protection Agency ("EPA"), "is meant to be a comprehensive estimate of climate change damages and includes, but is not limited to, changes in net agricultural productivity, human health, and property damages from increased flood risk."<sup>4</sup> Using established emission factors from the EPA and U.S. Energy Information Administration ("EIA"), the total amount of carbon pollution associated with the combustion of fossil fuels from Interior-managed lands and waters can be calculated and attendant costs estimated.

The social cost of carbon is "an estimate of the economic damages associated with a small increase in carbon dioxide (CO<sub>2</sub>) emissions, conventionally one metric ton, in a given year."

**- U.S. Environmental Protection Agency**

## CARBON COSTS IN THE BILLIONS

The resulting emissions and costs, which are based solely on the combustion of oil, gas, and coal as end-use products, are as follows. Just assessing carbon emissions associated with the combustion of oil, gas, and coal from Interior managed lands and waters, costs exceeds \$129 billion:

**Carbon Emissions and Costs Associated With Oil, Gas, and Coal Production From Interior Managed Lands and Waters in 2013<sup>5,6</sup>**

<b>Fossil Fuel Produced</b>	<b>Amount</b>	<b>Carbon Emission Factor, Metric Tons Per Unit</b>	<b>Total Carbon Emissions (million metric tons)</b>	<b>Cost of Carbon Estimate (millions of dollars)</b>
Oil	652 million barrels	0.43/barrel	280.36	28,316.36
Gas	4 trillion cubic feet	54,345,500/trillion cf	217.38	21,955.38
Coal	420 million tons	1.862/ton	782.04	78,986.04
<b>TOTALS</b>			<b>1,279.78</b>	<b>129,257.78</b>

These calculations assume that the sole end use of the oil, gas, and coal will be combustion. This is a reasonable assumption given that the primary purpose of producing these fossil fuels is to create energy through burning. Based on this assessment, total carbon emissions associated with Interior-Department's fossil fuel energy management amount to more than 1.2 billion metric tons. This represents more than 23% of all carbon emitted in the U.S. annually and equals the yearly emissions from 315 coal-fired power plants.<sup>7</sup>

In its Economic Contributions Report, the Interior Department provides two measures of the value of oil, gas, and coal. One is the "economic output contribution" value, which was reported to be \$220 billion. The second is the "value added" value, which was reported to be \$121 billion. Interior states that the "value added" value "more accurately captures the dollar-value of Interior's resource-management activities."<sup>8</sup>

The carbon costs above thus indicate that on a value added basis (i.e., the most accurate statement of economic contribution), the benefits of oil, gas, and coal produced from Interior Department-managed lands and waters do not outweigh carbon costs. Although on a value added basis, benefits were reported to be \$121 billion, carbon costs are more than \$129 billion, producing a loss of around \$8 billion.

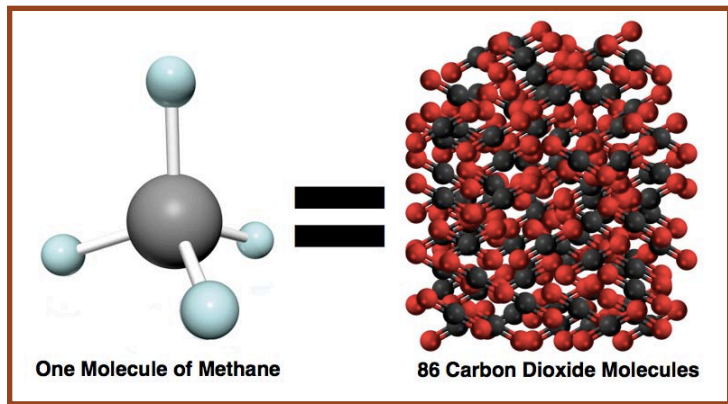
## COSTS UNDERSCORED BY RELATED CARBON RELEASES

It's significant, however, that the calculations above do not take into account indirect carbon emissions, such as from equipment fuel use, oil refining, and natural gas production and processing. For example, oil and gas production requires diesel-powered drilling rigs and pumps, trucks, and other heavy equipment to develop wells. Put another way, estimates of carbon emissions above are undoubtedly conservative.

Nowhere is this more apparent than with regards to methane emissions. Methane is a powerful greenhouse gas that the Intergovernmental Panel on Climate Change reports is 34 times more potent than carbon dioxide over a 100-year period and 86 times more potent over a 20-year period.<sup>9</sup> Oil, gas, and coal development and production all release large amounts of methane, and in turn significant amounts of carbon. The EPA most recently reported that oil and gas operations, and coal mines are the first and fourth largest sources of methane in the United States, respectively.<sup>10</sup>

Factoring in methane emissions from oil, gas, and coal production indicates that carbon emissions and resulting costs are much, much higher.

This is especially evident with regards to natural gas production, where studies report methane leaks account for up to 7.1% of all natural gas production.<sup>11</sup> With four trillion cubic feet of gas produced from Interior lands and waters in 2013, this would amount to 284,000,000,000 cubic feet of methane leaked. This amounts to 5,481,200 metric tons of methane, which is equal to 471,383,200 metric tons of carbon over a 20-year period.<sup>12</sup> This would push total carbon emissions from natural gas production on Interior lands and waters up to at least 688.76 million metric tons, making it the second most carbon-intensive form of fossil fuel development overseen by the Interior Department. It would also produce costs of \$69,564.76 million, a more than threefold increase from costs if methane values are not considered.



Taking into account the carbon cost of methane emissions from natural gas production, a comparison of the total carbon costs of oil, gas, and coal production with the \$121 billion “value added” value reported by Interior indicates the Department’s fossil fuel energy production could very well have cost the American public more than \$55 billion in 2013.

**Costs and Benefits of Oil, Gas, and Coal Production  
from Interior Department Lands and Waters**

<b>Carbon Cost of Oil, Gas, and Coal Taking into Account Methane from Natural Gas (millions of dollars)</b>	<b>Benefits Of Produced Oil, Gas, and Coal as Reported by Interior (millions of dollars)</b>	<b>Difference (millions of dollars)</b>
-176,867.16	121,000	<b>-55,867</b>



**Methane flaring at oil wells tapping the Bakken shale in North Dakota.  
Photo: Ecoflight ([Ecoflight.org](http://Ecoflight.org)).**

## **UNCERTAINTY UNDERSCORES EXPENSE**

Certainly, there are caveats here. Methane leakage rates from natural gas systems could be lower or higher. At the same time, this carbon cost figure does not account for methane emissions related to oil and coal production. The cost of carbon could also be lower or higher, depending on ultimate discount rates and depending on the discount year or years.

The calculations above take the simple approach of using only a 2013 discount year, which produces lower carbon costs than relying on a future discount year or a combination of current and future years. However, if any of the oil, gas, or coal sold by Interior in 2013 produces carbon emissions in later years, the costs will be higher.

Most importantly, these calculations do not take into account the costs of air pollution, any water contamination (including the cost of cleaning up oil spills), wildlife mortality and habitat degradation, loss of productivity of public lands, and degradation of the recreational value of Interior Department-managed lands and waters.<sup>13</sup>

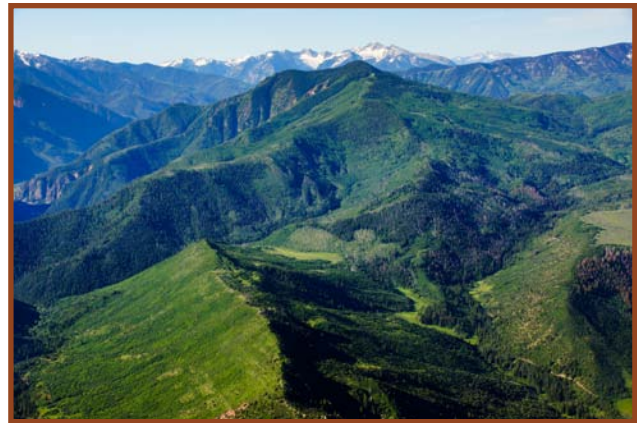
Overall, however, it appears that costs just associated with carbon are substantial and are very likely to overshadow the economic benefits reported by the Interior Department. Put simply, the assertion that oil, gas, and coal produced from Interior-managed lands and waters created \$121 billion in benefits (or even \$220 billion in benefits, for that matter) is not supported.

## CONCLUSION

The Interior Department is already under fire for failing to consider the carbon costs associated with coal production on public lands.<sup>14</sup> Their ongoing refusal to come clean with the American public on carbon costs raises serious concerns that Interior's efforts to facilitate more oil, gas, and coal production will undermine efforts to curtail carbon and safeguard the climate in the U.S.

Already, Interior is weighing dozens of new oil, gas, and coal proposals, primarily in the American West. In northeastern Wyoming alone, the Interior Department's Bureau of Land Management is weighing approval of a plan that would lease 10.2 billion tons of coal by 2035 from the Powder River Basin, the largest coal producing region in the nation.<sup>15</sup> If mined and burned, this coal stands to produce 16.92 billion metric tons of carbon.<sup>16</sup>

Other proposals include a 5,700 well oil and gas project in Duchesne County in northeastern Utah, which stands to lead to the release of 4.8 billion metric tons of carbon, and a 5,000 well oil and gas project in Converse County in eastern Wyoming, which stands to lead to the release of 392 million metric tons of carbon annually for 30 or more years.<sup>17</sup>



**The Interior Department is currently weighing whether to approve several oil and gas leases in the Thompson Divide area of western Colorado. Photo: Ecoflight ([Ecoflight.org](http://Ecoflight.org)).**

External costs associated with fossil fuel production may be difficult to quantify, but techniques to quantify carbon costs are available. In light of this, the Interior Department must take steps to ensure the true benefits of oil, gas, and coal are compared with their true climate costs. The American public, which ultimately owns the minerals managed by the Interior Department, deserves an honest accounting.



## End Notes

<sup>1</sup> The Department of Interior manages 20% of the nation's land base. See <http://www.doi.gov/oig/about/index.cfm>. According to the U.S. Bureau of Land Management, the primary mineral regulator under the Department of Interior, Interior has responsibility for at least 570 million acres of coal reserves, [http://www.blm.gov/wo/st/en/prog/energy/coal\\_and\\_non-energy.print.html](http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy.print.html) and current manages more than 36 million acres of onshore oil and gas leases, [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS\\_REALTY\\_AND\\_RESOURCE\\_PROTECTION/energy/oil\\_gas\\_statistics/data\\_sets.Par.67327.File.dat/numberofacresleasedlastday.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/energy/oil_gas_statistics/data_sets.Par.67327.File.dat/numberofacresleasedlastday.pdf).

<sup>2</sup> U.S. Department of Interior, "Economic Report, FY2013 Draft" (July 11, 2014), available online at [http://www.doi.gov/ppa/economic\\_analysis/upload/FY2013-Econ-Report-07-9-2014-2.pdf](http://www.doi.gov/ppa/economic_analysis/upload/FY2013-Econ-Report-07-9-2014-2.pdf).

<sup>3</sup> According to the EPA, the social cost of carbon is "an estimate of the economic damages associated with a small increase in carbon dioxide (CO<sub>2</sub>) emissions, conventionally one metric ton, in a given year." See <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>. It also reflects the benefits of prevented or reduced carbon emissions. Although normally utilized in rulemakings, the EPA has urged its use in the context of federal approval of the Keystone XL Pipeline project. See Light, Sarah E., "NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies," 87 Tul. L. Rev. 511, 545-46 & n. 160 (Feb. 2013). The U.S. Bureau of Land Management, an Interior Department agency, also recently joined as a Cooperating Agency in an environmental impact statement that utilized the social cost of carbon protocol to analyze and assess the impacts of issuing two coal lease modifications in western Colorado. See U.S. Forest Service, "Draft Environmental Impact Statement, Federal Coal Lease Modifications COC-1362 and COC-67232" (May 2012) at 150-152, available online at [http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/68608\\_FSPLT2\\_126547.pdf](http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/68608_FSPLT2_126547.pdf).

<sup>4</sup> Id.

<sup>5</sup> According to the EPA, average carbon dioxide emissions for oil consumption amount to 0.43 metric tons per barrel of oil, for natural gas production they amount to 0.005302 metric tons per therm consumed, and for coal consumption they amount to 0.000931 metric tons per pound of coal consumed. See <http://www.epa.gov/cleanenergy/energy-resources/refs.html>.

According to the EIA, one thousand cubic feet of natural gas equals 10.25 therms. See <http://www.eia.gov/tools/faqs/faq.cfm?id=45&t=8>. Thus, one trillion cubic feet would equal 10.25 billion therms and therefore 53,345,500 metric tons of carbon per trillion cubic feet.

For average coal consumption, 0.000931 metric tons per pound of coal produced would equal an average of 1.862 metric tons per ton of coal consumed given that there are 2,000 pounds in a ton.

<sup>6</sup> For cost of carbon estimates, we use the most recent U.S. Interagency Working Group estimates and a discount year of 2013 based on a 95<sup>th</sup> percentile value at a 3% discount rate, which amounts to a cost of \$101 per ton of carbon. See Interagency Working Group on Social Cost of Carbon, "Technical Support Document-Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866" (May 2012), available online at [http://www.whitehouse.gov/sites/default/files/omb/inforeg/social\\_cost\\_of\\_carbon\\_for\\_ria\\_2013\\_update.pdf](http://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf). We use the 95<sup>th</sup> percentile values because it is meant to "represent higher-than-expected impacts from temperature change[.]" In light of recent reports indicating that the Interagency Working Group social cost of carbon values are significantly underestimated (including reports from the Intergovernmental Panel on Climate Change), largely due to the failure to account for higher-than-expected impacts from temperature change, this is appropriate. See e.g., Howard, P, "Omitted Damages: What's Missing from the Social Cost of Carbon," Report Prepared for NRDC, Environmental Defense Fund, and Institute for Policy Integrity, available online at [http://costofcarbon.org/files/Omitted\\_Damages\\_Whats\\_Missing\\_From\\_the\\_Social\\_Cost\\_of\\_Carbon.pdf](http://costofcarbon.org/files/Omitted_Damages_Whats_Missing_From_the_Social_Cost_of_Carbon.pdf).

<sup>7</sup> According to the EPA, total carbon emissions in the U.S. are 5,383.2 million metric tons, or 5.383 billion metric tons. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012, EPA 430-R-14-003 (April 15, 2013) at ES-5, available online at <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Main-Text.pdf>. Coal-fired power plant emissions equivalency calculated from EPA's Greenhouse Gas Equivalencies Calculator, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>.

<sup>8</sup> See Economic Contributions Report at iii. See also Economic Contributions Report at 5 (stating, "...value added most accurately captures the dollar-value of Interior-managed resources in the U.S. economy").

<sup>9</sup> See IPCC, Climate Change 2013: the Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press (2013) at 731, available online at <http://climatechange2013.org/>.

<sup>10</sup> See EPA Greenhouse Gas Emission Inventory at ES-6.

<sup>11</sup> See Brandt, et al., "Methane Leaks from North American Natural Gas Systems," *Science*, 343:733-735 (Feb. 14, 2014), which found that methane leaks from natural gas systems were 50% higher than EPA estimates and providing a "high end" estimate of leakage rates at 7.1%. Some observers have chosen to use a more conservative 5.4% leakage rate based on Brandt, et al., but have noted that many studies report leakage rates much higher than 7.1%. For instance, in the Uinta Basin of Utah, where the majority of natural gas produced is from Interior lands, leakage rates as high as 12% have been reported. See <http://cires.colorado.edu/news/press/2013/methaneleaks.html>.

<sup>12</sup> This conversion was made using the EPA's "Interactive Units Converter" website at <http://www.epa.gov/cmop/resources/converter.html>.

<sup>13</sup> This oversight is especially significant given that fossil fuel companies routinely challenge fines for oil spills, forcing the U.S. Government to defend penalty assessments and oftentimes leading to reduced fines and less compensation for taxpayers. For instance, ExxonMobil is fighting penalties assessed after a pipeline owned by the company ruptured and spilled 63,000 gallons of oil into the Yellowstone River of Montana. See Brown, M., "Exxon challenges \$1.7M Yellowstone spill penalty," *Billings Gazette* (May 13, 2013), available online at [http://billingsgazette.com/news/local/exxon-challenges-m-yellowstone-spill-penalty/article\\_b97d3aeb-2217-5c3e-bbf2-615f2a36746c.html](http://billingsgazette.com/news/local/exxon-challenges-m-yellowstone-spill-penalty/article_b97d3aeb-2217-5c3e-bbf2-615f2a36746c.html).

<sup>14</sup> Most recently, the Interior Department lost in federal court over its failure to address carbon costs associated with coal mining, prompting a federal judge to enjoin a mine expansion in western Colorado. See *High Country Conservation Advocates v. U.S. Forest Service*, Docket no. 1:13-cv-01723-RBJ, slip op. (June 27, 2014).

<sup>15</sup> As part of its proposed Buffalo Field Office Resource Management Plan, which will guide public land and minerals management in northeastern Wyoming, the Bureau of Land Management expects 10.2 billion tons of coal to be leased in the next 20 years. See Bureau of Land Management, "Draft Resource Management Plan and Environmental Impact Statement for the Buffalo Field Office Planning Area" (June 2013) at 671, available online at [https://www.blm.gov/epl-front-office/projects/lup/36597/43453/46530/Bufalo\\_Draft\\_RMP\\_-\\_June\\_2013.pdf](https://www.blm.gov/epl-front-office/projects/lup/36597/43453/46530/Bufalo_Draft_RMP_-_June_2013.pdf).

<sup>16</sup> According to the Bureau of Land Management, coal mined from the Powder River Basin produces an average of 1.659 metric tons of carbon per ton of coal combusted. See Bureau of Land Management, "Final Environmental Impact Statement for the Wright Area Coal Lease Applications" (July 2010) at 4-140, available online at <http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/hpdo/Wright-Coal/feis.Par.33083.File.dat/01WrightCoalVol1.pdf>.

<sup>17</sup> See Comments submitted by WildEarth Guardians and others on proposed Monument Buttes Oil and Gas Development Project (UT) submitted March 5, 2014, available online at [https://climatewest.files.wordpress.com/2014/07/monument-butte\\_draft-eis-final.pdf](https://climatewest.files.wordpress.com/2014/07/monument-butte_draft-eis-final.pdf), and on proposed Converse County Oil and Gas Development Project (WY) submitted June 30, 2014, available online at <https://climatewest.files.wordpress.com/2014/07/conversecounty5000wellscooping.pdf>.