

# Estimating U.S. Government Spending on Coal: 2002 - 2010

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on Coal: 2002 - 2010**

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## Executive Summary

Coal is the most significant source of energy in the United States and has been for years. Like most other energy sources, coal has received support from the federal government. This report quantifies the amount the federal government spent to support coal during the period from 2002 to 2010. This report also identifies and, where possible, quantifies spending that benefited, but did not specifically target, coal

The Environmental Law Institute (ELI) previously examined federal government spending on energy sources in general, and this report focuses on coal. Part I of this report provides an introduction to the study and its methodology and Part II is a review of Coal Use and Environmental Impacts, the History of Spending on Coal, and Relevant Energy Spending Developments. Part III, Analysis, covers Targeted or Disproportionately Beneficial Expenditures, Non-Targeted Spending, and Expenditures Excluded from the Study.

This report focuses on federal government support for coal through spending and its equivalent in foregone revenue collection. As used here, such spending includes any action by the U.S. government that results in a cost to government and an identified benefit to coal production, transport, use, or waste disposal. These include foregone revenues, mostly in the form of tax expenditures (provisions in the U.S. Tax Code to reduce the tax liabilities of particular entities), and direct spending, in the form of expenditures on research and development and other programs. ELI has further divided federal coal spending into two analytical categories: 1) quantifiable spending that targets or significantly benefits coal production, use, or waste disposal; and 2) quantifiable spending that will benefit coal along with other energy sources or activities.

The federal government provided approximately \$25.425 billion in financial support for coal production, transport, use, or waste disposal during the period 2002-2010. The majority of these dollars - \$16.214 billion – are attributable to tax benefits. Of these tax benefits, the single largest category was the nonconventional fuels tax credit, providing \$12.22 billion to coal. Section IIIA1 of this report summarizes and quantifies these benefits. This credit is no longer available to producers of most coal-derived fuels and is set to sunset for all nonconventional fuels from coal by 2014.

The second major category is direct federal spending on coal, which totaled \$9.211 billion during the period 2002-2010. Section IIIA2 of this report summarizes and quantifies this spending. The vast majority of this direct spending on coal was by the Department of Energy's Office of Fossil Energy, which received \$8.843 billion in spending authority from Congress during this nine-year period. Almost 39% of the Office's funding was spent on carbon capture and sequestration (CCS) initiatives, with nearly all CCS funding coming from the 2009 stimulus bill, the American Reinvestment and Recovery Act (ARRA). Total spending for CCS was \$3,527.5 million, less than one seventh of the total targeted coal spending.

Targeted spending for coal mining (production) totaled \$2,866.6 million, less than one eighth of the more than \$25 billion total spending targeted for coal. Spending in support of coal mining derived almost entirely from tax benefits. Two of the smaller tax benefits for coal mining – the Indian coal production credit and the refined coal credit – will sunset in 2012 and 2020 respectively.

The second major category of support for coal is spending that benefits, but is not targeted at, coal. This category of spending is summarized in Section III B of this report. An example of this category is the Army Corps of Engineers operation and maintenance budget for harbors and inland waterways, which provides the most significant support for coal transportation, although Congress appropriates these funds without the specific intention of promoting coal. From 2002-2010, the government spent at least \$3.79 billion on programs such as these that were not specifically intended to benefit coal. The other significant contributor to this non-targeted spending was the Low-Income Home Energy Assistance Program (LIHEAP).

Spending was not evenly distributed among different stages of the coal “life cycle”—production, transport, processing and use, carbon capture and sequestration (CCS), and (non-CCS) waste disposal. The processing and use of coal were the primary beneficiaries of both direct spending and tax expenditures. The stage of the coal “life-cycle” that received the smallest amount of targeted spending was waste disposal.

Certain expenditures and other types of support were excluded from this study but are identified in Section III C. The analysis does not include:

- Liabilities created by loan guarantees
- The beneficial effects of regulations and standards
- The cost of regulatory activities
- Contributions to multilateral development banks
- Opportunities to maximize revenue through federal coal leasing
- De minimis tax expenditures, including provisions projected to create significant tax expenditures in the near future

Several limitations should be noted. The study, which identifies financial support in aggregate fiscal terms, does not seek to determine how this spending affects coal production or consumption, or whether it ultimately benefits consumers or industry. Such an assessment requires a considerably more complex level of analysis, one that exceeds the scope of this study.

The study also does not offer normative judgments about the subject of the spending. That is, the identification of coal-specific spending and foregone revenue collection does not constitute a recommendation that these expenditures be changed, but is simply intended to show how federal tax dollars support coal production and use.

## I. Introduction

This study examines federal spending to support coal production and consumption. It quantifies the amounts spent directly or through foregone revenue from fiscal year (FY) 2002 to FY 2010 and examines their origin and intended effects as expressed in the legislative history of applicable laws.<sup>1</sup> The nine-year timeframe of this study captures all policies and expenditures in effect during that period and demonstrates recent spending trends. As a result, findings do not illustrate a present-date “snapshot” of expenditure levels; rather, they reveal historic spending levels over a representative period of time that includes economic downturns, upswings, and shifts in policy, including a major economic stimulus. The federal legislation examined in the study includes policies and laws enacted at any time that resulted in a cost to government and the spending directly benefited coal between FY 2002 and FY 2010.

For purposes of this report, spending includes any action by the U.S. government that results in a cost to government and an identified financial benefit to coal use or production including mining, transport, electricity and heat generation, carbon capture and storage (CCS),<sup>2</sup> and waste disposal. Potential beneficiaries include mines, utilities, industry workers, and consumers, among others. This study takes into account taxes, fees, and other government levies targeted at coal that serve to increase government revenues. If these levies supported services beneficial to the coal sector from which they were raised, they are not counted against spending amounts (otherwise known as offsetting). In contrast, government levies that did not support coal were subtracted from the gross spending amount to produce net government expenditures.

For analytical purposes, coal expenditures are divided into two categories: 1) quantifiable expenditures that target or disproportionately benefit coal production, use, or waste disposal and 2) quantifiable expenditures that happen to benefit coal along with other energy sources. The targeted nature of each expenditure is discernable from the nature of that expenditure (e.g., exclusively supportive of coal use), the legislative history of its authorizing or appropriating legislation, and/or the stated agency purpose. In all cases the amount represents the cost to the federal General Fund, which does not necessarily correspond with the benefit of the expenditure to recipients. In some cases expenditures may not be quantifiable because they are not reported by the government, or are bundled with other expenses in budget accounting or tax codes. This report does not examine the effects of coal spending on prices, environmental quality, or other variables relevant to energy policy. Thus, the amount may not reflect the scale of the expenditure’s environmental effects. Carbon capture and storage is disaggregated because of its potentially positive environmental benefit, while some smaller expenditures (e.g., support of new coal-fired power plants and coal-to-liquids technology<sup>3</sup>) are identified that have potentially far-ranging, adverse environmental impacts.

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<sup>1</sup> For a more comprehensive review of federal government spending on fuels (excluding nuclear), see *Estimating U.S. Government Subsidies to Energy Sources: 2002 – 2008* (ELI 2009) [http://www.elistore.org/reports\\_detail.asp?ID=11358](http://www.elistore.org/reports_detail.asp?ID=11358).

<sup>2</sup> Carbon capture and storage is a developing technology that would allow utilities (primarily coal-burning) to capture and store their carbon dioxide emissions. While decreasing a plant’s efficiency, this technology would also reduce greenhouse gas emissions compared to coal plants that do not use the technology, or those using oil or natural gas to generate electricity.

<sup>3</sup> The coal-to-liquids (CTL), or Fischer-Tropsch, process is the method through which coal is burned to produce a synthetic gas which is then converted into a liquid fuel. CO<sub>2</sub> is a byproduct and has the potential to be captured and stored through CCS. The current cost of generating fuels through CTL is high and arguably prohibitive. See Anthony

Rather than establishing a *de minimis* cut-off in all cases, the study includes the most accurate quantitative data available. In the case of foregone revenues calculations, estimates are generally rounded to the nearest \$1 million. Estimates are conservative. Where disaggregation of coal was not possible due to a lack of specificity in agency budget justifications and an inability to estimate coal proportions, those programs are mentioned but not included in the estimated spending amount.

This report provides background on coal use and environmental impacts as well as relevant spending trends, followed by analysis of Category 1 (coal-specific) and 2 (non-targeted) expenditures, in conjunction with applicable legislative intent. Within these two categories, expenditures are discussed according to type in order of their estimated magnitude: 1) tax benefits and 2) direct spending including grants, R&D, and service provision (e.g. government maintenance of transportation infrastructure). The report indicates at what stage of the coal fuel cycle the expenditure applies: production, transport, utilization, CCS, or other waste disposal. Also, because the 2009 American Reinvestment and Recovery Act (ARRA, or the Stimulus Bill) authorized and appropriated an unusually high level of spending over a short period of time within the study period, the ARRA amounts are reported separately. The third section of the report discusses spending programs that are not currently in effect, but that are expected to generate a substantial cost to government in the future. This section includes categories of government actions or policies that do not fall under this study's definition of spending, even though they may have a financial effect on coal. Finally, the study concludes with a discussion of trends and policy implications. The Appendix discusses the sources and methods used to quantify the spending amounts.

This study builds upon the methodology and findings of *Estimating U.S. Government Subsidies to Energy Sources: 2002-2008*,<sup>4</sup> a 2009 report also published by the Environmental Law Institute. That study quantified spending (referred to as subsidies in that report) accruing to all energy sectors, primarily (but not exclusively) using the same cost-to-government definition that this study employs in its Category 1 list of expenditures. This study narrows the substantive focus to coal and expands the scope of the analysis to include additional fiscal years (2009 and 2010), legislative history, background, and Category 2 expenditures that were not targeted specifically at coal or that were not readily quantifiable.

## II. Background

### A. Coal Use and Environmental Impacts

During the period covered by this report, coal-fired power plants generated about 45% of U.S. electricity.<sup>5</sup> In 2010, 1285 coal mines<sup>6</sup> and 1396 coal-fired power plants<sup>7</sup> were operating in the

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Andrews and Jeffrey Logan. *Fischer-Tropsch Fuels from Coal, Natural Gas, and Biomass: Background and Policy*. CRS Report RL34133, August 15, 2007, available at <http://ncseonline.org/NLE/CRS/abstract.cfm?NLEid=1903>.

<sup>4</sup> See Environmental Law Institute (ELI), *Estimating U.S. Government Subsidies to Energy Sources: 2002-2008* (September 2009), available at [http://www.elistore.org/Data/products/d19\\_07.pdf](http://www.elistore.org/Data/products/d19_07.pdf); See also ELI, *Energy Subsidies Black, Not Green* (September 2009), available at [http://www.eli.org/pdf/Energy\\_Subsidies\\_Black\\_Not\\_Green.pdf](http://www.eli.org/pdf/Energy_Subsidies_Black_Not_Green.pdf).

<sup>5</sup> Calculated from EPA/EIA, *Electric Power Monthly July 2011 Edition*, Table 1.1, available at [http://www.eia.gov/cneaf/electricity/epm/epm\\_sum.html](http://www.eia.gov/cneaf/electricity/epm/epm_sum.html) (last visited July 21, 2011).

<sup>6</sup> *Coal Production and Number of Mines by State and Mine Type, 2010, 2009*, DOE/EIA-0584 (2010) (Nov. 2011) available at <http://www.eia.gov/coal/annual/pdf/table1.pdf> (last visited January 18, 2012).

U.S. More than 98 percent of coal consumed in the U.S. is produced domestically.<sup>8</sup> The U.S. exported 7.53 percent of its domestically produced coal.<sup>9</sup> In recent years, coal exports from the U.S. to Asia, especially China, have increased substantially.

Coal-fired power plants are the single largest source of greenhouse gases in the U.S., emitting on average about a ton of carbon dioxide (CO<sub>2</sub>) per megawatt-hour of electricity produced.<sup>10</sup> These emissions amounted to about one-third of U.S. CO<sub>2</sub> emissions.<sup>11</sup> Climate-related monetary damages range from 0.1 cents to 10 cents per kilowatt-hour, based on previous modeling studies.<sup>12</sup>

Coal combustion also has substantial air quality impacts, which generate significant social costs. According to the National Research Council (NRC), for 2005 alone, the external costs of sulfur dioxide (SO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>), and particulate matter (PM) associated with coal electricity generation totaled \$62 billion in the United States.<sup>13</sup> Premature mortality and other health costs were considered to constitute the vast majority of the damages. Mercury also poses health risks. In addition to coal combustion, coal mining also generates a host of adverse environmental impacts. The costs of these adverse effects are not included in this study.

## **B. History of Spending to Support Coal**

For more than a century, the federal government has provided financial support to coal for all stages of its life cycle (from production to waste disposal). Because of its domestic abundance, it has been viewed as a secure fuel source that generates domestic jobs and is therefore worthy of government support.

## **C. Relevant Energy Spending Developments**

The ARRA and the Energy Improvement and Extension Act of 2008, enacted as part of the 2008 Bailout,<sup>14</sup> created several new spending programs related to coal and increased some already in existence. In terms of direct spending, many of these new expenditures were directed at CCS, a priority of the 110th Congress.<sup>15</sup> Specifically, ARRA authorized \$1.52 billion for a Department of

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<sup>7</sup> Existing Generating Unit in the United States by State and Energy Source, 2010, EIA available at [http://www.eia.gov/electricity/capacity/xls/existing\\_gen\\_units\\_2010.xls](http://www.eia.gov/electricity/capacity/xls/existing_gen_units_2010.xls) (last visited January 18, 2012).

<sup>8</sup> U.S. Coal Supply and Demand: 2010 Year in Review (June 1, 2011), EIA available at [http://www.eia.gov/coal/review/coal\\_exports\\_imports.cfm](http://www.eia.gov/coal/review/coal_exports_imports.cfm) (last visited January 18, 2012).

<sup>9</sup> William Watson et al, U.S. Coal Supply and Demand: 2010 Year in Review (full report) (EIA 2011) available at <http://www.eia.gov/coal/review/pdf/feature10.pdf> (last visited January 18, 2012).

<sup>10</sup> National Research Council, *The Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*, at 10 (2009), available at [http://download.nap.edu/cart/download.cgi?record\\_id=12794&free=1](http://download.nap.edu/cart/download.cgi?record_id=12794&free=1). The National Research Council conducted this study in response to a request from Congress issued in EPAct 2005 (P.L. 109-58), Section 1352.

<sup>11</sup> U.S. Environmental Protection Agency (EPA), “Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2009,” (April 2011), <http://epa.gov/climatechange/emissions/usinventoryreport.html> (last visited July 22, 2011).

<sup>12</sup> National Research Council, *The Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*, Table 7-3 at 261 (2009), available at [http://download.nap.edu/cart/download.cgi?record\\_id=12794&free=1](http://download.nap.edu/cart/download.cgi?record_id=12794&free=1).

<sup>13</sup> National Research Council, *The Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*, at 262 (2009), available at [http://download.nap.edu/cart/download.cgi?record\\_id=12794&free=1](http://download.nap.edu/cart/download.cgi?record_id=12794&free=1).

<sup>14</sup> Energy Improvement and Extension Act of 2008, Pub. L. 110-343, Division B.

<sup>15</sup> Department of Energy, Recovery Act, <http://www.fe.doe.gov/recovery/index.html> (last visited July 20, 2011). See also, e.g., Presidential Memorandum, *A Comprehensive Federal Strategy on Carbon Capture and Storage*, February 3, 2010. (“Charting a path toward clean coal is essential to achieving my Administration’s goals of providing clean energy,

Energy (DOE) competitive solicitation for industrial carbon capture and energy efficiency improvement projects, including a small allocation for innovative concepts for beneficial reuse of CO<sub>2</sub> as well as \$50 million for a competitive solicitation for site characterization activities in geologic formations (with a focus on CO<sub>2</sub> sequestration) and \$20 million for geologic CO<sub>2</sub> sequestration training and research grants.<sup>16</sup> It also authorized \$1.0 billion for fossil energy R&D programs and \$800 million for the Clean Coal Power Initiative (CCPI), both of which focus heavily on CCS.<sup>17</sup> ARRA also created the Advanced Energy Project Credit, providing tax incentives for CCS and other energy activities. While most of the energy projects financed through ARRA involved renewable energy or CCS, the bill's Build America Bond program financed power projects without preference for renewable fuels. In the 2008 Bailout, Congress authorized \$1.5 billion additional tax credits for investments in coal projects that sequester a certain amount of their carbon emissions.<sup>18</sup> Some of the CCS tax incentives created in these two bills will only have significant fiscal impacts after the period of this study. These include the tax credit for carbon sequestration,<sup>19</sup> the treatment of income related to carbon sequestration as qualifying income for publicly traded partnerships,<sup>20</sup> and Qualified Energy Conservation Bonds for CCS research.<sup>21</sup>

Notwithstanding ARRA's infusion of support for CCS, recent federal budget shortfalls have generated a wide-ranging debate about federal fiscal policy. Concerted efforts have been made to cut certain forms of discretionary spending, including tax expenditures for oil and gas as well as ethanol.

At the international level, the U.S. has committed to "rationalize and phase out in the medium term fossil subsidies that encourage wasteful consumption" as part of the G-20 and the Asia Pacific Economic Cooperation (APEC).<sup>22</sup> While non-binding, this commitment may have reflected or stimulated changes within the Obama Administration's budget priorities. The Administration's 2011 and 2012 budget justifications omit requests for certain hydrocarbon production programs including natural gas technologies, unconventional oil, gas and coal resources, and ultra-deepwater and unconventional natural gas and petroleum research, citing inconsistency with "administration policy to phase out inefficient fossil fuel subsidies." Regardless of their

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supporting American jobs, and reducing emissions of carbon pollution. Rapid commercial development and deployment of clean coal technologies, particularly carbon capture and storage (CCS), will help position the United States as a leader in the global clean energy race.") <http://www.whitehouse.gov/the-press-office/presidential-memorandum-a-comprehensive-federal-strategy-carbon-capture-and-storage>. See also Report of the Interagency Task Force on Carbon Capture and Storage (August 2010), available at

<http://www.fe.doe.gov/programs/sequestration/ccstf/CCSTaskForceReport2010.pdf>

<sup>16</sup> Department of Energy, Recovery Act, <http://www.fe.doe.gov/recovery/index.html> (last visited July 20, 2011).

<sup>17</sup> Department of Energy, Recovery Act, <http://www.fe.doe.gov/recovery/index.html> (last visited July 20, 2011).

<sup>18</sup> Energy Improvement and Extension Act of 2008, Pub. L. 110-343, Division B., Section 111, codified at IRC sections 48A and 48B.

<sup>19</sup> Energy Improvement and Extension Act of 2008, Pub. L. 110-343, Division B., Section 115, codified at IRC section 45Q.

<sup>20</sup> Energy Improvement and Extension Act of 2008, Pub. L. 110-343, Division B., Section 116, codified at IRC section 7704(d)(1)(E).

<sup>21</sup> Energy Improvement and Extension Act of 2008, Pub. L. 110-343, Division B., Section 301, codified at IRC section 54D. Although no CCS projects received support from the \$800 initially authorized for the QECB program, the \$3.2 billion authorized by ARRA had not been fully allocated at the time of this report's preparation.

<sup>22</sup> Following in the G-20's footsteps, the Asia-Pacific Economic Cooperation (APEC) forum made a similar pledge to phase out fossil-fuel subsidies, extending the commitment to an additional 11 countries. See Kerry Lang, *The First Year of the G-20 Commitment on Fossil-Fuel Subsidies: A commentary on lessons learned and the path forward*, at 8 (January 2011), available at [http://www.globalsubsidies.org/files/assets/ffs\\_g20\\_firstyear.pdf](http://www.globalsubsidies.org/files/assets/ffs_g20_firstyear.pdf).

nonbinding nature, the G-20 and APEC commitments highlight the emerging consensus that fossil fuel subsidies distort the energy market, burden budgets, and can contribute to climate change.

### III. Analysis

#### A. Targeted or Disproportionately Beneficial Expenditures

##### 1. Tax Benefits

*Credit for Production of Nonconventional Fuels (\$12,220 million) (utilization)* - IRC Section 45K. This section provides a tax credit for the production of qualifying fuels. Since Congress established this credit in 1980, several amendments have revised the list of qualifying fuels. Through 2002, qualifying fuels included coalbed methane, oil shale, and tar sands. In the period 2003-07, the credit was available for biomass fuels and liquid, gaseous, or solid synthetic fuels from coal. Beginning in 2008, the credit was limited to facilities producing coke or coke gas. The credit will expire in 2014 for these facilities; it is available for facilities that were producing coke or coke gas before January 1, 2010, and only for the first four years of those facilities' operation.

*Characterizing Coal Royalty Payments as Capital Gains (\$940 million) (production)* - IRC Section 631(c). Income from the sale of coal under a royalty contract may be treated as a capital gain rather than ordinary income for qualifying individuals. Congress established this tax treatment with the 1951 Revenue Act in order to insulate coal miners from the high marginal tax rates that existed during the Korean War era.<sup>23</sup> In 1986, President Reagan proposed eliminating capital gains treatment for coal royalties as part of a major tax reform initiative.<sup>24</sup> President Obama has proposed repealing capital gains treatment for coal royalties in both his 2011 and 2012 budgets.<sup>25</sup>

*Excess of Percentage over Cost Depletion (\$703 million) (production)* - IRC Section 613. Taxpayers may deduct 10 percent of gross income from coal production. In 1986, President Reagan proposed repealing percentage depletion as part of a major tax reform initiative.<sup>26</sup> President Obama has proposed repealing percentage depletion for coal in both his 2011 and 2012 budgets.<sup>27</sup>

*Credit for Clean Coal Investment (\$681 million) (utilization, CCS)* - IRC Sections 48B and 48A. IRC Sections 48A and 48B create a series of tax credits for energy investments. First, a credit is available for 20 percent of the basis of integrated gasification combined cycle property. Congress has authorized \$1.15 billion for these credits, reserving at least \$800 million for coal projects. Second, a credit is available for 15 percent of the basis for other advanced coal-based generation technologies.

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<sup>23</sup> Environmental and Energy Study Institute, Fossil Fuel Subsidies: A Closer Look at Tax Breaks, Special Accounting, and Societal Costs (June 2011) at 2, available at [http://files.eesi.org/fossil\\_fuel\\_subsidies\\_062311a.pdf](http://files.eesi.org/fossil_fuel_subsidies_062311a.pdf).

<sup>24</sup> Congressional Budget Office, Tax Reform: Its Effect on the Coal Industry, Staff Working Paper (May 1986) at 5, available at <http://www.cbo.gov/ftpdocs/83xx/doc8348/86doc10a.pdf>.

<sup>25</sup> OMB, Budget of the United States Government, Fiscal Year 2011 at 162, available at <http://www.gpoaccess.gov/usbudget/fy11/pdf/budget.pdf>; OMB, Budget of the United States Government, Fiscal Year 2012 at 185, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2012/assets/budget.pdf>.

<sup>26</sup> Congressional Budget Office, Tax Reform: Its Effect on the Coal Industry, Staff Working Paper (May 1986) at 18, available at <http://www.cbo.gov/ftpdocs/83xx/doc8348/86doc10a.pdf>.

<sup>27</sup> OMB, Budget of the United States Government, Fiscal Year 2011 at 162, available at <http://www.gpoaccess.gov/usbudget/fy11/pdf/budget.pdf>; OMB, Budget of the United States Government, Fiscal Year 2012 at 185, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2012/assets/budget.pdf>.

Congress has authorized \$500 million for this tax credit over ten years. Both of these credits were originally created in the 2005 Energy Policy Act. In the 2008 bailout, Congress amended sections 48A and 48B to create additional incentives for carbon sequestration: 30% investment credits are now available for gasification projects that sequester at least 75% of carbon emissions (up to \$250 million) and advanced coal projects that sequester at least 65% of carbon emissions (up to \$1.25 billion). In 2010, the Treasury Department awarded a \$417 million tax credit for a coal-fired plant in Taylorville, Illinois, that is designed to capture at least 65% of its carbon emissions.<sup>28</sup> While section 48B credits are available for gasification of coal and other materials, the IRS includes these credits as appropriate when it tracks "credits for clean coal investment."

*Exclusion of Benefit Payments to Disabled Miners (\$460 million) (production)* - 30 U.S.C. 922(c). Disability payments out of the Black Lung Disability Trust Fund are not treated as taxable income. In contrast, disability payments from sources like Social Security may be taxed as income to the recipients. The study categorized this special treatment for Black Lung Disability Trust Fund payments as tax breaks that benefit coal because mining companies can provide a certain level of support to disabled employees with lower contributions to the Trust Fund than would otherwise be possible.

*Amortization of Coal Pollution Control (\$412 million) (utilization)* - IRC Section 169. The amortization period for certain pollution control devices for coal-fired power plants is significantly shorter than the generally applicable 20 year recovery period for conventional electric utility tangible property. The Tax Reform Act of 1969 created a five-year amortization period for pollution control equipment installed at facilities placed in service before 1976. Devices at newer facilities did not benefit from a favorable amortization period until the Energy Policy Act of 2005 created a seven-year amortization period for them. Today, most of the fiscal impact of this provision comes from the seven-year amortization for pollution control at newer facilities. This subsidy also has the unintended consequence of creating a disincentive for developing new facilities.<sup>29</sup>

*Exploration & Development Expensing (\$410 million) (production)* - IRC Section 617. Certain costs may be deducted as business expenses rather than amortized, such as the costs of surface stripping and construction of shafts and tunnels.<sup>30</sup> President Obama has proposed repealing the expensing of exploration and development costs in both his 2011 and 2012 budgets.<sup>31</sup>

*Special Rules for Mining Reclamation Reserves (\$180 million) (production)* - IRC Section 468. This deduction is available for early payments into reserve trusts, with eligibility determined by the Surface Mining Control and Reclamation Act and the Solid Waste Management Act. The amounts attributable to

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<sup>28</sup> U.S. Energy Information Agency, Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010 (July 2011), at 10 available at <http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf>.

<sup>29</sup> Congressional Research Service, Tax Expenditures: Compendium of Background Material on Individual Provisions, at 211-13 (December 2006), available at <http://www.gpo.gov/fdsys/pkg/CPRT-109SPRT31188/pdf/CPRT-109SPRT31188.pdf>.

<sup>30</sup> The JCT estimates the fiscal impact of expensing exploration and development costs of oil and gas separately from "other fuels", a category that includes coal, uranium, and geothermal wells. Within the "other fuels" category, this report assumes that the tax expenditure on fuel sources other than coal is *de minimis* because the number of coal mines dwarfs the number of uranium mines and geothermal wells.

<sup>31</sup> OMB, Budget of the United States Government, Fiscal Year 2011 at 162, available at <http://www.gpoaccess.gov/usbudget/fy11/pdf/budget.pdf>; OMB, Budget of the United States Government, Fiscal Year 2012 at 185, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2012/assets/budget.pdf>.

mines rather than solid-waste facilities are conservatively assumed to be one-half of the total. When this provision was adopted in 1984, proponents argued that it was necessary to encourage reclamation and protect mining companies from the general rules regarding deduction of future costs.<sup>32</sup>

*Indian Coal Production Credit (\$85 million) (production)* - IRC Section 45. Provides a per-ton credit for coal produced in Indian country. This credit is only available for facilities that were in service before 2009 and is set to expire after 2012.

*Refined Coal Credit (\$60 million) (utilization)* - IRC Section 45. Provides a credit for the production of refined coal in the first 10 years of a facility's operation. The credit is phased out when the price of coal rises above certain levels and only available for facilities placed in service before 2010. Congress created this credit with the American Jobs Creation Act of 2004 (P.L. 108-357).

*Expensing Advanced Mine Safety Equipment (\$58 million) (production)* - IRC Section 179E. The costs of qualifying mine safety equipment may be deducted as business expenses rather than recovered through depreciation. Congress created this provision in the Tax Relief and Welfare Act of 2006 (P.L. 109-432), which originally expired at the end of 2008. Congress has extended this provision twice and it is now scheduled to expire at the end of 2011.<sup>33</sup>

*Advanced Energy Project Credit (\$5 million) (CCS)* - IRC Section 48C. This provision authorizes a credit for investments in manufacturing facilities for renewable energy infrastructure, electric vehicles, electric grids, CCS equipment, and other property. Congress created this credit in ARRA, authorizing a \$2.3 billion tax expenditure. In consultation with the Department of Energy, the Treasury selected projects to receive all authorized credits and two CCS projects received approximately \$5 million.

## 2. Grants and other Direct Expenditures

This section describes federal direct expenditures for all stages of coal production and consumption, in order of the magnitude of their cost to the government.

***Department of Energy, Office of Fossil Energy (\$8,843.1 million) (utilization, CCS, waste disposal)***  
*\$ 3,473 million from ARRA*  
*\$ 3,422 million to CCS*

The U.S. Department of Energy (DOE) supports over 90 percent of all government coal-related research, development, and demonstration (R&DD).<sup>34</sup> Most of this research is for downstream components of the coal fuel cycle: primarily coal utilization technology and

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<sup>32</sup> Congressional Research Service, Tax Expenditures: Compendium of Background Material on Individual Provisions, at 202 (December 2006), available at <http://www.gpo.gov/fdsys/pkg/CPRT-109SPRT31188/pdf/CPRT-109SPRT31188.pdf>.

<sup>33</sup> Emergency Economic Stabilization Act of 2008, P.L. 110-343, Sec. 311; Tax Relief Unemployment Insurance Reauthorization and Job Creation Act of 2010, P.L. 111-312, Sec. 743(a).

<sup>34</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2008, at 114.

transmission as well as, in more recent years, CCS.<sup>35</sup> A small portion is spent on waste disposal. These expenditures are included in this study because DOE R&DD benefits coal use. Even though CCS may produce positive social benefits by reducing atmospheric CO<sub>2</sub> levels, government support of CCS is considered a benefit to coal because it will make compliance with any future limit on CO<sub>2</sub> emissions less costly to coal users.

The DOE's Office of Fossil Energy Research and Development (FER&D) leads the DOE's coal research efforts, and the National Energy Technology Laboratory (NETL) administers its coal-related research. With a self-described mission to "create technology and technology-based policy options for public benefit by enhancing U.S. economic, environmental, and energy security," FER&D develops technologies "to enhance the clean use of domestic fossil fuels and to reduce emissions from fossil-fueled electricity generation plants to achieve near-zero atmospheric emissions power production."<sup>36</sup> Congress's motivation for support of FER&D—based on economic, environmental, and energy security concerns<sup>37</sup>—has expanded from a traditional coal and pollution focus to reduction of CO<sub>2</sub> emissions. Before passage of the 2005 Energy Policy Act,<sup>38</sup> the Senate Committee on Appropriations deemed FER&D's research mission "to make clean energy from fossil fuels more marketable, affordable and accessible, and to move these technologies toward domestic and international commercialization."<sup>39</sup> The goal of the Clean Coal Power Initiative (CCPI) and other coal-related programs, according to the committee, was to develop "virtually pollution-free coal power plants within the next 15 to 20 years and doubling the amount of electricity produced from the same amount of fuel."<sup>40</sup> In 2010, CO<sub>2</sub> became a primary focus of Congress as the House committee report for the Energy and Water Development Appropriations Act of 2010<sup>41</sup> listed as FER&D's main goal protection of the environment "by reducing carbon dioxide and pollutant emissions into the atmosphere, increase[ing] efficiency for power generation, and improve[ing] compliance and stewardship operations of fossil energy activities"<sup>42</sup>

Within FER&D, the coal program is the largest, consistently constituting over two-thirds of the office's annual budget. Other programs include environmental restoration and, until recently, natural gas technologies and unconventional fossil energy such as oil and gas.<sup>43</sup> In recent years, FER&D has undergone several program realignments. For budgetary purposes, the office is currently divided into three sections: the CCPI,<sup>44</sup> Fuel and Power Systems, and CCS and Power Systems. The CCS Demonstration program, including the CCPI, FutureGen 2.0,<sup>45</sup> and Industrial

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<sup>35</sup> National Research Council. Coal: Research and Development to Support National Energy Policy. Washington: Natl. Acad., 2008, at 115.

<sup>36</sup> DOE FY2012 Congressional Budget Request, Volume 3, at 471.

<sup>37</sup> S. Rep. No. 109-84

<sup>38</sup> Energy Policy Act of 2005, 42 U.S.C.A. § 15961-64, Pub.L. 109-58, Title IV, § 401-04, 119 Stat. 749-50, 753 (2005).

<sup>39</sup> *Id.*

<sup>40</sup> House Committee Report for the Energy and Water Appropriations Act of 2006, H.R. Rep. No. 109-86

<sup>41</sup> Pub. L. No. 111-85

<sup>42</sup> Pub. L. No. 111-85

<sup>43</sup> The Administration did not request funding for these two programs in its FY2012 budget request "consistent with administration policy to phase out inefficient subsidies." DOE, FY2012 Congressional Budget Request, February 2011, Volume 3, pgs 472, 571.

<sup>44</sup> Since its inception in 2001, CCPI has been implemented in three stages, with the focus changing from advancing coal efficiency technologies to gasification and advanced clean-up systems (including mercury control) and, most recently, to CCS. DOE FY2010 Congressional Budget Request, May 2009, Volume 7, pgs. 35-36.

<sup>45</sup> FutureGen began as a \$950 million coal-fueled prototype plant meant to coproduce electricity and hydrogen while minimizing the release of air pollutants and greenhouse gases into the atmosphere. The DOE cancelled funding in 2008

CCS Demonstrations funded in large part by ARRA, involves a portfolio of commercial-scale projects focused on carbon capture and storage (CCS) technologies that aim “to ensure clean, reliable, and affordable electricity for the United States.”<sup>46</sup> All three are cost-shared partnerships between the government and industry to develop and demonstrate advanced coal-based power generation and industrial technologies at the commercial scale. Beyond CCPI and other CCS-related initiatives, other coal R&DD programs include pollution control innovations for traditional power plants (including mercury reduction), improved gasification technologies, advanced combustion systems, development of stationary power fuel cells, and improved turbines for future coal-based combined cycle plants.

ARRA provided an infusion of funds into CCS research. Specifically, it authorized \$1.52 billion for a competitive solicitation for industrial carbon capture and energy efficiency improvement projects, including a small allocation for innovative concepts for beneficial reuse of CO<sub>2</sub> as well as \$50 million for a competitive solicitation for site characterization activities in geologic formations (with a focus on CO<sub>2</sub> sequestration) and \$20 million for geologic CO<sub>2</sub> sequestration training and research grants.<sup>7</sup> It also authorized \$1.0 billion for fossil energy R&D programs and \$800 million for the CCPI.<sup>47</sup>

***Congressionally Directed Projects (Utilization and CCS) (approximately \$265 million) (utilization, CCS)***  
*\$0 from ARRA*  
*\$ 43.1 million to CCS*

The DOE’s research programs also implement congressionally directed projects (CDPs, or earmarks), which are included in authorizing or appropriating legislation and which appear separately within the DOE budget. FER&D CDPs vary from coal liquefaction and gasification research to solid oxide fuel cells and CCS, among other coal-related technologies.

***Department of Energy, Advanced Research Projects Agency-Energy (\$49.4 million) (CCS)***  
*\$49.4 million from ARRA*  
*\$49.4 million to CCS*

Authorized by the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act (COMPETES) Act of 2007 (P.L. 110-69). The Advanced Research Projects Agency-Energy (ARPA-E) is charged with the dual mandates of enhancing national economic and energy security (through energy efficiency and reduction of energy imports

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due to rising costs, and a revised project was launched in 2010 as FutureGen 2.0. Construction is scheduled to begin in late 2012 and be completed by the end of 2015. The cost is projected at \$1.3 billion. The project is led by Ameren Energy Resources and FutureGen Alliance in cooperation with the DOE. The project is the first to integrate CO<sub>2</sub> capture, transport and storage processes, and aims to sequester more than 90 percent of the plant’s CO<sub>2</sub> emissions – approximately 1.3 million metric tons per year. United States Government Accountability Office, *Clean Coal: DOE’s Decision to Restructure FutureGen Should be Based on a Comprehensive Analysis of Costs, Benefits and Risks*, (2009); FutureGen Alliance, FutureGen2.0 Facts, (2011), available at <http://www.futuregenalliance.org/pdf/FutureGenFacts.pdf>.

<sup>46</sup> DOE, FY2012 Congressional Budget Request, February 2011, Volume 3, at 471.

<sup>7</sup> Department of Energy, Recovery Act, <http://www.fe.doe.gov/recovery/index.html> (last visited July 20, 2011).

<sup>47</sup> Department of Energy, Recovery Act, <http://www.fe.doe.gov/recovery/index.html> (last visited July 20, 2011).

and energy-related emissions) and ensuring the U.S. maintains its lead in energy technology.<sup>48</sup> ARRA appropriated its initial funding of \$400 million. The only coal-related research that ARPA-E supports relates to CCS. Specifically, its Innovative Materials and Processes for Carbon Capture Technologies (IMPACCT) program researches materials, improvements to existing processes, and supports demonstration of new capture processes with the aim of reducing the cost of CCS. According to the DOE, “[i]f successful, the IMPACCT program will allow the continued use of America’s coal infrastructure without further increases in carbon dioxide emissions.”<sup>49</sup>

### ***U.S. Geological Survey Coal Assessment (\$21.7 million) (production)***

Established in 1879 to further "classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain,"<sup>50</sup> the U.S. Geological Survey (USGS) assesses, publishes, and maintains public databases with information about U.S. mineral deposits, including coal resources and reserves. Since 2007, it has also assessed carbon sequestration potential in subsurface environments. Spending on this program is included in this report because the provision of information about coal reserves and carbon storage benefits coal use. The information has both public and private benefits. It is useful to public policy makers and regulators as well as to private companies, even though it may not fully supplant their private data collection efforts.

In partnership with other state and federal land management agencies, the USGS leads government coal resource assessment work through its Energy Resources Program (ERP). According to the USGS, these coal assessments provide an appraisal of how much of the total U.S. coal resource base is available for production in the near and mid-term future.<sup>51</sup> Toward this end, the USGS maps and characterizes the quality and quantity of coal resources; inventories the location, recoverability, and accessibility of coal reserves; and maintains coal resource databases that are publicly accessible.<sup>52</sup> The National Coal Resources Data System (NCRDS), for example, contains information on the location, quantity, attributes, stratigraphy, and chemical components of U.S. coal deposits.<sup>53</sup> According to the USGS, the NCRDS data produce “a robust suite of products addressing coal resource assessment issues, including locating coal deposits with desirable characteristics for specific uses . . . evaluating coal resources; and describing technological properties of coal from specific areas and beds.” The cost to government of this database is considered spending to benefit coal for purposes of this report.<sup>54</sup>

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<sup>48</sup> 42 U.S.C. § 16538

<sup>49</sup> DOE, *FY 2012 Detailed Budget Justification*, Volume 3, at 441., available at <http://www.cfo.doe.gov/budget/12budget/Content/Volume3.pdf>.

<sup>50</sup> 20 Stat. 394; 43 U.S.C. § 31

<sup>51</sup> USGS Energy Resource Program, Coal Assessments, <http://energy.usgs.gov/Coal/AssessmentsandData/CoalAssessments.aspx> (last visited July 25, 2011).

<sup>52</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2008. Pgs. 48 – 49.

<sup>53</sup> U.S. Department of the Interior. *Budget Justifications and Performance Information Fiscal Year 2012, U.S. Geological Survey*, at J-79 – J-80 available at [http://www.usgs.gov/budget/2012/greenbook/greenbook\\_2012.pdf](http://www.usgs.gov/budget/2012/greenbook/greenbook_2012.pdf).

<sup>54</sup> Additional USGS databases also benefit coal use but are not included in the total USGS coal spending amount because their costs to government were impossible to disaggregate from other non-coal programs with which they were reported in the agency budget. These include the National Coal Quality Inventory, which provides a compilation of the chemical data of coal used in power plants that enables federal and state regulatory agencies, electric power utilities, and

***Support for Seaward Loading Facility (\$10.9 million) (transport)***

A \$9.6 million grant from the Federal Railroad Administration (FRA) in 2004 enabled the Alaska Railroad Corporation (ARRC) to acquire and improve the Seward Coal Loading Facility (SCLF).<sup>55</sup> Located in Seward, Alaska, at the southern terminus of the ARRC, the 25-year-old facility's primary purpose is to "unload coal from railcars, convey the coal to storage, reclaim coal from storage, and load coal into bulk ships."<sup>56</sup> Grant funds were used to acquire the facility and perform associated due diligence studies, evaluation and inspection. According to ARRC, these funds improved operational efficiency and lowered coal transport costs.<sup>57</sup> Because this cost to government improved coal transportation directly, it is included in this study as spending to benefit coal.

***USGS Carbon Capture and Storage (CCS) Research (\$8.0 million) (CCS)***

*\$0 from ARRA*

*\$8.0 million to CCS*

The USGS conducts CCS R&D at a relatively small scale compared to DOE efforts. For the reasons described above, these expenditures are included as spending to benefit coal, but also disaggregated in the spending total because of its potentially positive environmental effect. The USGS Geological Carbon Sequestration Assessment began in 2008,<sup>58</sup> in accordance with the Energy Independence and Security Act (EISA) directive that USGS research carbon sequestration as a viable option to reduce US dependence on foreign energy.<sup>59</sup> In response, USGS completed a project to "develop the methodology for the assessment of carbon storage in physical (oil and gas) traps and saline formations"<sup>60</sup> in 2009. In 2010, USGS began developing the final report of this initiative, "National Assessment of Geological Storage Capacity for Carbon Dioxide."<sup>61</sup> In addition, in its Water Resources Program, the USGS is also assessing CCS potential in deep saline aquifers.<sup>62</sup>

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the coal industry to "quickly access and display detailed coal-quality information, to address air-quality issues, and to maintain compliance with the 1990 Amendments to the Clean Air Act." USGS, "Energy Resources Program of the U.S. Geological Survey," <http://pubs.usgs.gov/fs/fs032-01/fs032-01.pdf>. In addition, the USGS's World Coal Quality Inventory provides a compilation of coal quality data from around the world. *Id.*

<sup>55</sup> This support for the project was directed in a \$9.6 million earmark, introduced by Senator Stevens in the 2003 Omnibus Appropriations Bill. 108<sup>th</sup> Congress, 1<sup>st</sup> Session, House of Representatives (2003). "108-10: Making Further Continuing Appropriations for the Fiscal Year 2003, And for Other Purposes – Conference Report to accompany H.J. Res. 2." <http://thomas.loc.gov/cgi-bin/cpquery/T?&report=hr010&dbname=108&>.

<sup>56</sup> Alaska Railroad Corporation, *Seward Coal Loading Facility* (January 4, 2011), available at [http://alaskarailroad.com/Portals/6/pdf/projects/2011\\_01\\_05\\_Seward\\_Coal\\_Facility\\_PROJ.pdf](http://alaskarailroad.com/Portals/6/pdf/projects/2011_01_05_Seward_Coal_Facility_PROJ.pdf)

<sup>57</sup> Alaska Railroad Corporation, *Seward Coal Loading Facility* (January 4, 2011), available at [http://alaskarailroad.com/Portals/6/pdf/projects/2011\\_01\\_05\\_Seward\\_Coal\\_Facility\\_PROJ.pdf](http://alaskarailroad.com/Portals/6/pdf/projects/2011_01_05_Seward_Coal_Facility_PROJ.pdf)

<sup>58</sup> USGS was assessing CCS before 2007, but this cost to government is not included in the spending total because disaggregation was not possible with the publicly available budget information. Thus, this study's estimation of the CCS expenditures is necessarily understated.

<sup>59</sup> Energy Independence and Security Act of 2007, [Pub.L. 110–140, Title VII, § 711](#), 121 Stat. 1710 (2007)

<sup>60</sup> U.S. Department of the Interior, *Budget Justifications and Performance Information for Fiscal Year 2010, U.S. Geological Survey*, at M-9 or 465, available at [http://www.usgs.gov/budget/2010/greenbook/FY2010\\_USGS\\_Greenbook.pdf](http://www.usgs.gov/budget/2010/greenbook/FY2010_USGS_Greenbook.pdf).

<sup>61</sup> U.S. Department of the Interior, *Budget Justifications and Performance Information for Fiscal Year 2010, U.S. Geological Survey* at C-21 or 77, available at [http://www.usgs.gov/budget/2010/greenbook/FY2010\\_USGS\\_Greenbook.pdf](http://www.usgs.gov/budget/2010/greenbook/FY2010_USGS_Greenbook.pdf).

<sup>62</sup> Disaggregated deep saline aquifer R&D spending was not available in the USGS budget justification. (Jerad Bales, USGS Chief of Research and Programs for Water, pers. Comm., June 24, 2011.)

***Department of Energy, Energy Information Administration (production) (\$5.5 million)***

The DOE's Energy Information Administration (EIA) provides research and reports on all energy sectors, and is an important resource for both the energy industry and the public. Specifically with regard to coal, EIA conducts annual surveys of coal producers/preparation plants and coal distributors and collects data on coal reserves, coal bed statistics, production capacity, sales and revenue, and coal distribution by state of origin to state of destination including transportation mode. These data are used to estimate weekly coal production by state and develop short-term and long-term forecasts of coal supply and demand, providing a timely, reliable source of information on market trends for the industry for strategic planning and market analysis and to support rational spot markets and futures markets.<sup>63</sup>

***Department of Energy, Office of Energy Efficiency and Renewable Energy (\$3.4 million) (production)***

Through its Industrial Technologies Program, the DOE funded the Mining Industry of the Future initiative from 1999 to 2006. The initiative's goal was to support engineering and technology development designed to improve the energy efficiency, resource utilization, and competitiveness of the mining industry.<sup>64</sup> Because this R&D on coal production improvements benefited coal at a cost to government, it is included in the coal expenditures for purposes of this study. Although the program did not focus solely on coal mining and processing, a National Research Council (NRC) study found many of the program outputs improved knowledge of production phases of the coal fuel cycle.<sup>65</sup> NRC's summation of the coal-specific elements amounted to \$734,000 for FY 2005.<sup>66</sup> Taking this estimation on its face, together with the NRC finding that appropriations for the program decreased each year from 1999 to 2005, ELI estimated the FY 2002 through FY 2005 cost to government at \$734,000 annually.

***Environmental Protection Agency Office of Solid Waste (\$2.2 million) (waste disposal)***

In partnership with the coal industry and other government agencies (i.e. the DOE, USDA and US Federal Highway Administration), the EPA led the Coal Combustion Products Partnership (C2P2) from 2002 to 2009. Through production of written materials and workshops, the

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<sup>63</sup> These reports are available at U.S. Energy Information Administration, <http://www.eia.gov/coal/> (last visited December 1, 2011).

<sup>64</sup> DOE, Energy Efficiency & Renewable Energy, Mining, <http://www1.eere.energy.gov/industry/mining/partnerships.html#roadmaps> (last visited July 25, 2011)

<sup>65</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2007, at 151.

<sup>66</sup> Of the coal-related projects undertaken during the eight-year history of the program, 87 percent addressed mining and processing issues and 13 percent responded to safety and health issues; funding for 2005 was distributed according to this ratio.

partnership promoted the beneficial use of Coal Combustion Products (CCPs) including fly ash. According to C2P2 materials, increased CCP use can reduce both the costs associated with managing coal ash and slag disposal and the GHG emissions of CCP consumers, including concrete manufacturers and highway construction entities.<sup>67</sup> It can also generate revenue from the sale of ash and savings from the use of CCPs in place of more costly materials.<sup>68</sup> Because CCP development is reducing the cost of waste disposal of the coal mining industry, the C2P2 cost to government is included in the spending attributed to coal use.

The EPA estimates the expense of its program at \$250,000 per year. In 2010, the C2P2 became inactive as EPA began to revise coal fly ash disposal regulations. However, EPA's CCP educational efforts continue.

***Department of Defense, Coal-to-Liquids Research*** (\$1 million) (utilization)  
*\$unknown from ARRA*

The Department of Defense (DOD) has supported research into the suitability of fossil-based synthetic fuel derived from coal, referred to as coal-to-liquids (CTL). Because this research benefits coal use, the cost to government of CTL R&D is included in this report and attributed to coal use. Title III of the Energy Policy Act of 2005<sup>69</sup> directs the Secretary of Defense to develop a strategy for using fuel produced from coal. The John Warner National Defense Authorization Act for FY2007<sup>70</sup> authorized the Secretary of Defense to carry out a military construction project for energy conservation that may include procurement of fuel derived from coal. Also, in the Conference Report (H. Rept. 109-676) to the Department of Defense Appropriations Act of 2007,<sup>71</sup> conferees encouraged the Department to provide sufficient funding in future budget requests to continue research into coal-based jet fuel substitutes.<sup>72</sup>

In particular, the Air Force has funded research activities in academia and industry along with in-house investigations performed in the Air Force Research Laboratory.<sup>73</sup> For example, one program (Defense Research Sciences) conducts applied research on alternative hydrocarbon-based aviation fuels made from coal, including fuel property evaluation and enhancement, as well as engine testing of alternative fuels and fuel blends. Between FY2008 and FY2009, Congress added \$1.7 million for a Coal Transformation Laboratory to focus on barriers that inhibit commercialization of

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<sup>67</sup> EPA, USWAG, ACAA, *C2P2 Fact Sheet* (January 2003), available at <http://www.uswag.org/C2P2facts508.pdf>.

<sup>68</sup> EPA, USWAG, ACAA, *C2P2 Fact Sheet* (January 2003), available at <http://www.uswag.org/C2P2facts508.pdf>.

<sup>69</sup> P.L. 109-58

<sup>70</sup> P.L. 109-364

<sup>71</sup> P.L. 109-289

<sup>72</sup> However, in light of concerns about CTL's GHG intensity, the Energy Independence and Security Act (EISA) of 2007 (P.L. 110-140) requires federal contracts for alternative or synthetic fuels to specify that the lifecycle GHG emissions associated with their production and combustion not exceed emissions from conventionally produced petroleum-based fuel. See EISA 2007 Section 526. See also Letter from Hon. Henry A. Waxman, Chairman, Committee on Oversight and Government Reform, and Hon. Tom Davis, Ranking Minority Member, Committee on Oversight and Government Reform, to Robert M. Gates, Secretary, Department of Defense, January 30, 2008. Repeal of Section 526 passed the House of Representatives on July 7, 2011. See <http://www.eenews.net/eenewspm/2011/07/08/4>

<sup>73</sup> Department of the Air Force, *Fiscal Year (FY) 2010 Budget Estimates*, Research, Development, Test, and Evaluation (RDT&E), Descriptive Summaries, Volume 1, Budget Activities 1 - 3, May 2009, <http://www.saffm.hq.af.mil/shared/media/document/AFD-090511-079.pdf>.

coal-to-liquid technologies.<sup>74</sup> Another program (Aerospace Propulsion) evaluates fuel properties and characteristics of alternative fuels developed from unconventional sources, including coal.

Additionally, the Defense Advanced Research Projects Agency (DARPA) openly solicited proposals for innovative research in using coal as an energy resource in late 2008.<sup>75</sup> In its solicitation, DARPA expressed interest in technologies that will ultimately enable the U.S. to economically extract energy from its coal resources in the form of liquid fuels using coal-to-liquid conversion technologies that are environmentally friendly and cost-competitive with petroleum-based fuels.

The precise amounts spent on CTL research were not discernible from DOD's budget justifications. ELI therefore conservatively estimated the amount as more than \$1 million.

### ***Export-Import Bank (\$1 million) (utilization)***

Created in 1945 by the Export-Import Bank Act, the Export-Import Bank (Ex-Im) supports U.S. exporters by assuming the credit and country risks of export markets that the private sector is unable or unwilling to accept.<sup>76</sup> Toward this end, Ex-Im provides fees, working capital guarantees, and insurance to commercial banks to make trade credit available to U.S. exporters.<sup>77</sup> It also offers direct financing to U.S. exporters on a limited basis. Exports of coal technology have enjoyed Ex-Im "authorization" support for decades.<sup>78</sup> Within the time period of this study, Ex-Im supported two major new coal-fired power plants in India and South Africa with \$900 million and \$805 million loan guarantees to U.S. companies supplying the projects, respectively.<sup>79</sup>

Although the amount of Ex-Im support is minimal in terms of its cost-to-government, the environmental impact of this new power generation is likely to be substantial. According to one assessment, the India coal plant will produce carbon dioxide emissions equivalent to one-fifth of the coal plants proposed in the United States.<sup>80</sup> Because there is a cost to government of this support, at

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<sup>74</sup> In S. Rept. 110-335 to the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (P.L. 110-417), the committee recommended an increase of \$3.0 million in PE 63216F for research on assured aerospace fuels to assess alternative fuels from sources such as coal, biomass, and shale.

<sup>75</sup> Defense Advanced Research Projects Agency, "Coal To Liquids (CTL) Solicitation Number: DARPA-BAA-08-58" (September 4, 2008), [https://www.fbo.gov/?s=opportunity&mode=form&id=8226e0da6edf77f9c80016717c55bf21&tab=core&\\_cview=0](https://www.fbo.gov/?s=opportunity&mode=form&id=8226e0da6edf77f9c80016717c55bf21&tab=core&_cview=0) (last visited July 25, 2011).

<sup>76</sup> Export-Import Bank of the United States, Mission, <http://www.exim.gov/about/mission.cfm> (last visited July 22, 2011).

<sup>77</sup> Export-Import Bank of the United States, Lenders, <http://www.exim.gov/portals/lender/overview.cfm> (last visited July 22, 2011).

<sup>78</sup> Export-Import Bank of the United States, Key Industries at Export-Import Bank, <http://www.exim.gov/products/special/keyindustries.cfm> (last visited July 22, 2011).

<sup>79</sup> "Ex-Im Bank Approved \$917 Million Export Financing For India's Sasan Power Plant", <http://www.exim.gov/pressrelease.cfm/CFB580F2-E776-AC80-7D98FF8EDD2F1CBD/> .  
"Ex-Im Bank Financing for Sub-Saharan Africa Exceeds \$1 billion For First Time", <http://www.exim.gov/pressrelease.cfm/2E560B41-CC82-8990-CEE6DAB96D3ED6FE/>.

<sup>80</sup> Friends of the Earth 2010.

least administratively, the support is considered in this study, but the amount is estimated to be \$1 million.

## **B. Non-Targeted Expenditures**

### **1. Tax Benefits**

*Tax Exclusion for State and Local Bonds* (utilization) - IRC Sections 103 and 142. Interest on bonds issued by states or their political subdivisions (commonly known as municipal bonds or muni bonds) is not included in taxable income. In addition, there is an exclusion from income for interest on "private activity bonds" to finance facilities for certain local electricity providers. Effectively, the federal government supports these activities by allowing entities to obtain financing at a lower interest rate than that which they could obtain from private borrowers or the U.S. Treasury. While the IRS does not keep track of the number or amount of tax exempt bonds that have been used to finance the construction and improvement of coal-fired power plants, the numbers are likely substantial: over \$81 billion in municipal bonds were issued for electrical power projects in the period 2002-06.<sup>81</sup> The tax expenditure on private activity bonds for local energy facilities is approximately \$100 million each year.

*Accelerated Cost Recovery System* - IRC Section 168. IRS asset depreciation schedules define how quickly taxpayers can recover the costs of specific types of capital assets. Shorter recovery periods benefit the taxpayer by reducing the present value of their tax liability. Depreciation schedules have a subsidizing effect when the recovery period is shorter than the actual life of the asset. Under the current Modified Accelerated Cost Recovery System (MACRS), mining equipment has a recovery period of seven years.<sup>82</sup> Because this generally underestimates the useful life of mining equipment, the marginal effective tax rate on investments in mining equipment is drastically less than the prevailing corporate tax rate.<sup>83</sup> ELI did not include the subsidizing effects of the accelerated depreciation system on coal producers and users because the system was not created in order to support coal. Further, the IRS does not track the deductions taken according to type of asset or taxpayer. Tax expenditures associated with statutorily mandated, energy-specific depreciation rules were, however, included under *Targeted or Disproportionately Beneficial Expenditures*.

*Domestic Manufacturing Deduction (production)* - IRC Section 199. Since 2004, this deduction has been available to all employers engaged in domestic manufacturing. Arguably, the deduction disproportionately benefits coal mining companies; in 2006, 55% of corporate taxable income in the mining sector qualified for the deduction, while 29% of corporate taxable income economy-wide qualified.<sup>84</sup> Nonetheless, the provision does not meet ELI's definition of expenditures directed at coal because it was not created with the specific intention of benefiting the coal mining industry and the industry receives a small portion of the expenditure on the deduction. President Obama has

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<sup>81</sup> Government Accountability Office, *Tax-Exempt Status of Certain Bonds Merits Reconsideration, and Apparent Noncompliance with Issuance Cost Limitations Should Be Addressed* (February 2008) at Appendix III available at <http://www.gao.gov/new.items/d08364.pdf>.

<sup>82</sup> Internal Revenue Service, *How to Depreciate Property* 104 (2011), available at <http://www.irs.gov/pub/irs-pdf/p946.pdf>.

<sup>83</sup> Department of the Treasury, *Report to The Congress on Depreciation Periods and Recovery Methods* 37 (Table 5), (July 2000), available at <http://www.treasury.gov/resource-center/tax-policy/Documents/depreci8.pdf>.

<sup>84</sup> Nicholas Johnson and Ashali Singham, *Center on Budget and Policy Priorities, States Can Opt Out of the Costly and Ineffective "Domestic Production Deduction" Corporate Tax Credit* (Table 1) (January 14, 2010), [http://www.cbpp.org/cms/index.cfm?fa=view&id=553#\\_edn5](http://www.cbpp.org/cms/index.cfm?fa=view&id=553#_edn5) (last visited September 23, 2011).

proposed repealing the application of this credit for hard mineral fossil fuels in both his 2011 and 2012 budgets, estimating in the 2012 budget that the policy change would save \$1.353 billion over 10 years.<sup>85</sup>

*Certain Income and Gains Treated as Qualifying Income for Publicly Traded Partnerships* - IRC section 7704(d)(1)(E). Income derived from the exploration, development, processing or transportation of coal and other resources is treated as "qualifying income" for a publicly traded partnership. Publicly traded partnerships receive favorable tax treatment when at least 90% of their income is from "qualifying" sources. In the 2008 Bailout, Congress created an additional incentive for carbon sequestration by treating income from industrial source carbon dioxide as qualifying income. This provision was not included in this tally of coal expenditures because government statistics do not disaggregate the tax expenditure associated with coal or carbon dioxide. However, the tax expenditure on "exceptions for publicly traded partnership with qualified income derived from certain energy-related activities" during 2002-09 was approximately \$1.3 billion.

*Build America Bonds (utilization)* - IRC 54AA. Congress created this new kind of tax credit bond in ARRA, authorizing a cost to the treasury equal to 35 percent of the interest on the bonds. Local governments were allowed to issue an unlimited number of qualifying bonds through the end of 2009. Of the over \$181 billion in Build America Bond financing,<sup>86</sup> 5% of proceeds were used for electric and public power projects.<sup>87</sup>

## 2. Grants and other Direct Expenditures

### ***Low-Income Home Energy Assistance Program (LIHEAP) (utilization) (\$1,795.2 million)***

The Low Income Home Energy Assistance Program (LIHEAP) allocates block grants to states so they can provide low-income households with energy assistance. In a typical year, over half of the funds are used to assist with heating costs, while remaining funds are used to assist with cooling costs, state leveraging and outreach programs, and weatherization efforts. The federal funds are distributed among the states primarily according to the percentage of low-income energy costs found within each state.<sup>88</sup> Historically, this means that the highest level of funding has been allocated to certain Northeastern and Midwestern states, whose residents use more home energy to keep warm during the winter. Preliminary eligibility for state LIHEAP programs is determined by income, with roughly 15 percent of eligible households ultimately receiving aid. LIHEAP covers less than 10 percent of the total winter heating costs of all federally eligible households, with an

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<sup>85</sup> OMB, *Budget of the United States Government, Fiscal Year 2011* 162, available at <http://www.gpoaccess.gov/usbudget/fy11/pdf/budget.pdf>; OMB, *Budget of the United States Government, Fiscal Year 2012* 185, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2012/assets/budget.pdf>.

<sup>86</sup> U.S. Treasury Department, *Treasury Analysis of Build America Bonds Issuance and Savings* 2 (May 26, 2011), available at <http://www.treasury.gov/initiatives/recovery/Documents/BABs%20Report.pdf>.

<sup>87</sup> Municipal Securities Rulemaking Board, *Build America Bonds Issuance and Trade Activity, 2009* (February 2010), available at [http://www.msrb.org/Market-Topics/~/\\_media/Files/Special-Publications/MSRBBuildAmericaBondsReport2009.ashx](http://www.msrb.org/Market-Topics/~/_media/Files/Special-Publications/MSRBBuildAmericaBondsReport2009.ashx).

<sup>88</sup> The formula for allocating funds to the states has changed since the inception of the LIHEAP program. For more information, see U.S. Dep't of Health and Human Services, *Low Income Home Energy Assistance Program, Report to Congress for Fiscal Year 2005*, app. B (April 24, 2008).

average benefit per recipient household in 2005 of just over \$300.<sup>89</sup> Between FY 2002-2010, total annual federal LIHEAP appropriations ranged from \$1.77-\$5.00 billion. Focusing only on spending on heating, cooling, and crisis benefits generates an approximate amount of \$1.39-\$3.70 billion annually in energy benefits.

The purpose of LIHEAP is to prevent home energy shut-offs, rather than to intervene in energy markets. However, the basic structure of the program is to provide low-income households with the means to make their utility payments, the vast majority of which cover the cost of energy generated by fossil fuels. Under the study methodology, this qualifies as a “cost to government” associated with energy production or use. The EIA report (2007) calculates the lump sum of LIHEAP appropriations, but does not treat these as electricity- or fuel-specific spending, noting that the major forms of energy affected are No. 2 fuel oil, natural gas, coal, and electricity end use.<sup>90</sup> Koplow (2003) categorizes LIHEAP as a consumption intervention, similarly counting all the annual appropriations, with the major beneficiaries identified as mostly oil, gas, electricity, and some demand-side management.<sup>91</sup> The rationale for counting LIHEAP as spending that benefits coal, as well as other fuel oil, natural gas, and other sources of power, is that it provides funds to conventional fuel companies for accounts that would otherwise become delinquent.

ELI used the detailed estimates of states’ usage of funds from the LIHEAP Reports to Congress to determine the amounts spent on energy (heating, cooling, and crisis benefits) for all years through FY 2007, which is when the most recent LIHEAP Report to Congress was published. These historical figures were used to determine that the average percentage of total LIHEAP appropriations spent on energy benefits was 72.61 percent. This average was used to estimate the energy expenditures for 2008-2010.

From this modified appropriations figure, ELI estimated the funds used on electricity payments. According to the 2005 Residential Energy Consumption Survey as reported in the 2007 LIHEAP Report to Congress, 19 percent of LIHEAP recipient households used electricity as the main heating fuel. Thus, 19 percent of each year’s energy benefits was calculated to estimate the amount spent on electricity. Finally, coal usage in the LIHEAP program was estimated using the percentage of electricity generated by coal as reported by the EIA.<sup>92</sup>

***Department of Defense, U.S. Army Corps of Engineers Improvement, Operation and Maintenance of Inland Waterway and Harbor Infrastructure (transport) (\$1,225.1 million)***  
*\$ Indeterminate amount from ARRA*

In most years from 2002 - 2010, the U.S. government spent between 200 and 350 billion dollars on maintaining and improving hundreds of harbor channels and nearly 12,000 miles of coastal and inland waterways. The U.S. Army Corps of Engineers (the Corps) develops and maintains much of the system for the federal government. About 20 percent of waterway cargo is

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<sup>89</sup> U.S. Dep’t of Health and Human Services, *Low Income Home Energy Assistance Program, Report to Congress for Fiscal Year 2005*, app. B (April 24, 2008).

<sup>90</sup> EIA, *Federal Financial Interventions and Subsidies in Energy Markets 2007*, at 36-38, 167-168 (2007).

<sup>91</sup> Memorandum from Doug Koplow, Earthtrack, Inc., to Jason Grumet and Drew Kodjak, National Commission on Energy Policy, *Federal Subsidies to Energy in 2003 - A First Look*, at 5 (July 30, 2004).

<sup>92</sup> EIA’s 2009 Electric Power Annual, Table ES1, except for 2010, which is from EIA’s Electric Power Monthly, June 2011 edition, Table ES1.B.

coal, the largest commodity by volume moving on the inland waterways.<sup>93</sup> U.S. electric utilities depend on the inland waterways for over 20 percent of the coal they consume to produce electricity.<sup>94</sup> Thus, ELI calculated the expenditures that benefit coal as equal to 20 percent of the total amount spent on waterway and harbor maintenance from the General Fund. Coal markets benefit to the extent user fees do not cover shippers' share of the cost of this work, making the cost to government an expenditure that benefits coal.

Before 1986, all costs of waterway and harbor construction, operation, and maintenance were borne by the federal government. The Water Resources Development Act (WRDA) of 1986 (P.L. 99- 662) established two different cost-share systems for harbors and inland waterway projects.

For harbors and channels, the Harbor Maintenance Trust Fund (HMTF) finances 100 percent of operation and maintenance (O&M) expenditures. A \$0.125 percent *ad valorem* tax (the Harbor Maintenance Tax, (HMT)) on the value of commercial cargo using harbors funds the HMTF. According to a GAO report on federal user fees, approximately \$1.4 billion is credited to the HMTF annually, but only about \$900 million is actually spent.<sup>95</sup> The HMTF balance was expected to be over \$5 billion at the end of FY2010.<sup>96</sup>

In contrast to harbors and channels, inland waterways receive federal support from the General Fund as well as the Inland Waterways Trust Fund, a corpus funded by a \$.20 per gallon of fuel tax levied on commercial users for fuel consumed in inland waterway transportation. Construction improvements and O&M are funded differently. Construction and major rehabilitation costs are covered by a 50-50 cost share between the IWTF and private parties. The IWTF spends \$85 million in contributions annually, and all of this amount is spent and matched one-for-one by General Fund contributions.<sup>97</sup> O&M costs, on the other hand, are fully covered by the General Fund whose support amounts to about \$500 million annually and has been essentially level (in constant dollars) since the 1970s.<sup>98</sup>

In addition to these regular expenditures, ARRA authorized \$403.1 million to inland waterway system lock and dam modernization construction projects.<sup>99</sup> This does not require cost-sharing from the IWTF. Also, the ARRA allocates \$2.075 billion to O&M generally. It is not clear how much of this sum has been spent on inland waterways and harbors.

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<sup>93</sup> National Research Council. Coal: Research and Development to Support National Energy Policy. Washington: Natl. Acad., 2007, at 85.

<sup>94</sup> National Research Council. Coal: Research and Development to Support National Energy Policy. Washington: Natl. Acad., 2007, at. 84

<sup>95</sup> GAO, Federal User Fees: Substantive Review Needed to Align Port-Related Fees with the Programs they Support, GAO-08-321, at 26–27 (2008).

<sup>96</sup> Congressional Research Service, John Frittelli, Harbor Maintenance Trust Fund Expenditures, January 10, 2011, R41042, <http://www.fas.org/sgp/crs/misc/R41042.pdf>. ELI's 2009 report on federal energy subsidies did not consider federal funding for harbor maintenance because it was not targeted at energy sectors and because HMT appears to cover all government costs of harbor O&M. See Environmental Law Institute (ELI), *Estimating U.S. Government Subsidies to Energy Sources: 2002-2008* (September 2009), available at [http://www.elistore.org/Data/products/d19\\_07.pdf](http://www.elistore.org/Data/products/d19_07.pdf).

<sup>97</sup> Inland Waterways Users Board, *24<sup>th</sup> Annual Report* Appendix A, at 11 (October 2010), available at [http://www.waterwaysusers.us/Annual\\_Report\\_FY10.pdf](http://www.waterwaysusers.us/Annual_Report_FY10.pdf).

<sup>98</sup> National Research Council. Coal: Research and Development to Support National Energy Policy. Washington: Natl. Acad., 2007, at 85.

<sup>99</sup> [http://www.waterwaysusers.us/Annual\\_Report\\_23.pdf](http://www.waterwaysusers.us/Annual_Report_23.pdf)

ELI estimated the untargeted spending that benefits coal as twenty percent of the annual \$85 million General Fund matching expenditure, the \$500 million O&M costs, and the additional ARRA funds.

***Department of Health and Human Services, National Institute for Occupational Safety and Health (production) (\$200 million)***

Established by the 1970 Occupational Safety and Health Act to prevent work-related illness, injury, disability, and death by gathering information, the National Institute for Occupational Safety and Health (NIOSH) focuses on R&D related to high-risk sectors such as mining. The Federal Mine Safety and Health Amendments Act of 1977 delegated additional authority to NIOSH for coal mine health research, including the development of recommendations for mine health standards, administering a medical surveillance program for miners, conducting on-site investigations, and testing and certifying personal protective equipment and hazard measurement instruments. Because NIOSH R&D produces information that enables mines to comply with mandatory mine safety standards more efficiently, its expenditures are included in this study as an untargeted benefit to coal use.

The NRC considered NIOSH's research a form of support for coal R&D. It disaggregated coal support and found it amounted to \$23 million for 2005, roughly two-thirds of NIOSH's total mine safety budget. For this study, ELI assumed this proportion held for 2002 to 2010. Based on a review of NIOSH's budget from 2002 to 2010, ELI estimated the amount allocated to coal research at \$200 million.

***Department of Energy, Office of Electricity Delivery and Energy Reliability (utilization) (\$285.0 million)***

*Unknown percentage of \$4.5 billion from ARRA*

In addition to research targeted at coal utilization and CCS, the DOE also conducts and supports research on electricity transmission and distribution. Created in 2003, the Office of Electricity Delivery and Energy Reliability (OE), aims to "lead national efforts to modernize the electric grid, enhance security and reliability of the energy infrastructure and facilitate recovery from interruptions in energy supply." Toward this end, it researches various electricity-related topics including high-temperature superconductivity, development of pre-commercial prototypes of electric power equipment, transmission reliability, energy storage, and grid materials, among others. Beginning in 2007, OE has focused its work on smart grid technology and renewables integration. ARRA included \$4.5 billion for OE activities and directed the funds be used to modernize the grid, enhance security and reliability, and implement smart grid activities.<sup>100</sup>

Because OE R&D supports the expansion and improvement of electricity, approximately half of which derives from coal in the U.S., its cost to government is a non-targeted expenditure that benefits coal for purposes of this study. In 2005, the NRC calculated OE's coal R&D support

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<sup>100</sup> American Reinvestment and Recovery Act, Pub. L. No. 111-5, 123 Stat. 115 at 138 (2009).

according to the proportion (45 percent) of national electricity generation supplied by coal-fired power plants. ELI applied this same method, but notes that the amount must be discounted to the extent OE's support of smart grid efficiency and integration of renewable fuels has resulted in a shift away from coal use. Thus, ELI used the NRC method (\$50 million annually) to estimate OE's spending in support of coal from 2002 until 2006 as a conservative estimate. From 2009-2010, there were substantial appropriations from ARRA that have not been quantified.

***U.S. Department of Agriculture, Rural Utilities Service (\$164.0 million) (utilization)***

Located in USDA's Rural Development mission, the RUS makes direct loans and loan guarantees to finance the construction of electricity distribution, transmission, and generation facilities, including system improvements and replacements required to furnish and improve electricity service in rural areas.<sup>101</sup> Established by the Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994 to replace the Rural Electrification Administration, RUS now administers the USDA's electricity program.<sup>102</sup> Its loans go to corporations, states, territories, municipalities, people's utility districts, and cooperative, nonprofit, or mutual associations that provide retail electricity service to rural areas or supply the power needs of distribution borrowers in rural areas.

Until 2006, the RUS provided loans to rural electric cooperatives seeking federal assistance to build new coal-fired power plants. Between 2002 and 2008, about \$1.6 billion in loans were made to coal-fired power plant construction.<sup>103</sup> The RUS has halted these direct loans for coal-fired power plants pending an Office of Management and Budget (OMB) recalculation of the subsidy rate to reflect the risks associated with the construction of new base load generation plants.<sup>104</sup> Because support took the form of loans rather than direct grants, the cost-to-government subsidy of these coal loans was minimal.

The RUS calculates and reports the subsidy rate for each type of loan and loan guarantee, in accordance with the Federal Credit Reform Act. ELI summed these rates in proportion with the amount of electricity that is derived from coal in the serviced areas (in this case, 80 percent), and also added administrative costs. By this calculation, the subsidizing effect of RUS loans amounted to only \$27 million while administrative costs of the program totaled \$355 million.

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<sup>101</sup> Specifically, the RUS makes three types of direct loans for electricity purposes: (1) hardship rate loans with a five percent interest rate made to borrowers that have a relatively high cost of providing service; (2) municipal rate loans with an interest rate tied to an index of municipal borrowing rates; and (3) Treasury rate loans with an interest rate matching the government's cost of money. See USDA, Rural Development, <http://www.usda.gov/rus/> (last visited July 25, 2011).

<sup>102</sup> Pub. L. No. 103-354, 108 Stat. 3221 (1994).

<sup>103</sup> Steven Mufson, "Government Suspends Lending for Coal Plants", *Washington Post* (March 13, 2008), <http://www.washingtonpost.com/wp-dyn/content/article/2008/03/12/AR2008031203784.html>; U.S. Representative Henry Waxman, Chairman of the Committee on Oversight and Government Reform, letter to James M. Andrew, Administrator of the Rural Development Utilities Program of the USDA (February 14, 2008), *available at* <http://meic.org/files/energy/highwood/Waxman%202.14.08.pdf>.

<sup>104</sup> James M. Andres, Administrator of the Rural Development Utilities Program of the USDA, letter to U.S. Representative Henry Waxman, Chairman of the Committee on Oversight and Government Reform (March 11, 2008), *available at* <http://democrats.oversight.house.gov/images/stories/documents/20080312104146.pdf>

In addition to direct loans, indirect forms of financial assistance in the form of lien accommodations (RUS sharing or release of its lien on debtors' property)<sup>105</sup> and lien subordinations (RUS agreeing that its lien on debtor property be ranked below the lien of another entity)<sup>106</sup> may assist borrowers in obtaining financing from other lenders.<sup>107</sup> Some critics have characterized these forms of support as subsidies.<sup>108</sup> These actions likely result in a cost to government, albeit one so small it is difficult if not impossible to quantify.

***U.S. Department of Labor, Mine Safety and Health Administration (MSHA) (\$12.7 million)  
(production)***

Within the Department of Labor, the Mine Safety and Health Administration (MSHA) provides technical support and training services to its personnel and to personnel from the mining industry. MSHA also evaluates new equipment and materials for use in coal mines and undertakes field investigations, laboratory studies, and cooperative research activities on health and safety issues in support of its inspection and technical support functions of coal mines.<sup>109</sup> It also supports state miner training activities through its state grants program. The NRC found that MSHA spent \$1.3 million on coal mine R&D in 2006.<sup>110</sup> Assuming the budget has not changed substantially, ELI estimated the same level of funding for 2002 to 2010. From this total, the amount spent to train regulators must be subtracted, as the cost of regulation is not considered spending that benefits coal for purposes of this study. ELI did not disaggregate these sums from the MSHA budget and therefore estimated the sum to be between \$1 and \$10 million. In the summary calculations and graphics, ELI conservatively estimated the amount to be \$1 million.

**C. Expenditures Excluded from the Study**

**1. Future liabilities**

Expenditures that are authorized but have not yet resulted in a cost to government are not included in this study's total spending amount. However, some authorizations that are likely to result in substantial future expenditures warrant mention. This section explains some of these expenditures.

**a. Taxes**

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<sup>105</sup> 7 C.F.R. 1792.102.

<sup>106</sup> 7 C.F.R. 1792.102.

<sup>107</sup> For example, in 2007, when Sunflower Electric Power Corporation sought private financing for its coal-fired Holcomb plant in Kansas, the RUS agreed to the subordination of its security interest in the plant. Environmental groups claim this and other actions violate the National Environmental Policy Act. *See* Sierra Club v. USDA Civ. Action No. 07-01860(EGS). *See also* Lucy Johnston et al., *Phasing Out Federal Subsidies for Coal* (April 13, 2010), available at <http://www.sierraclub.org/coal/downloads/2010-04-13-FedCoalReport.pdf>.

<sup>108</sup> Lucy Johnston et al., *Phasing Out Federal Subsidies for Coal*, Synapse Energy Economics, Inc. (April 13, 2010), available at <http://www.sierraclub.org/coal/downloads/2010-04-13-FedCoalReport.pdf>.

<sup>109</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2007, at 152

<sup>110</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2007, Table 7.2, at 113

*Tax Credit for Carbon Sequestration* - IRC section 45Q. This credit is available for building facilities that sequester more than 500,000 tonnes of carbon per year. Congress created this credit as part of the 2008 Bailout. The Joint Committee on Taxation predicted that the credit would not have a major fiscal impact until 2011 and that the provision would cost \$1.119 billion in the period FY09-FY18. In 2010, about \$1 million of this credit was directed at two CCS projects.<sup>111</sup>

## b. Direct Expenditures

### ***DOE Loan Guarantees for Coal-based Power Generation and Industrial Gasification Facilities***

Some observers have raised concerns about the DOE Loan Guarantee Program's (LGP) support for coal-fired power plants and CCS through the DOE's loan guarantee program.<sup>112</sup> Although some projects are purportedly in the negotiations phase, no projects had advanced to LGP term sheet finalization or closure through the end of 2010.<sup>113</sup> Thus, the LGP had not generated a cost to government by supporting coal projects during the period of this study. Because there are several projects still in the negotiation phase, a future subsidy may be imminent.

Authorized by Title XVII of the Energy Policy Act of 2005,<sup>114</sup> the program offers billions of dollars in loan guarantees to new energy technologies, including "advanced coal" that includes coal-based power generation and industrial gasification facilities that incorporate CCS or other "beneficial uses" of carbon.<sup>115</sup> The ARRA expanded the LGP to support a wider range of renewable energy projects.<sup>116</sup> In the FY08 Appropriations Act, Congress authorized \$6 billion in loan guarantees for CCS projects.<sup>117</sup> In September of 2008, the DOE solicited applications for coal-based power generation and industrial gasification facilities that incorporate carbon capture and sequestration or other beneficial uses of carbon and for advanced coal gasification facilities.<sup>118</sup> According to the GAO, as of July 2010, the LGP had received applications for \$18.6 billion in loan guarantee support, more than double the \$8 billion authorized for the program.<sup>119</sup>

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<sup>111</sup> U.S. Energy Information Agency, *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010* 10 (July 2011), available at <http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf>.

<sup>112</sup> Lucy Johnston et. al, *Phasing Out Federal Subsidies for Coal*, Synapse Energy Economics, Inc. (April 13, 2010), available at <http://www.sierraclub.org/coal/downloads/2010-04-13-FedCoalReport.pdf>.

<sup>113</sup> DOE, Loan Program Office, "The Financing Force Behind America's Clean Energy Economy", [http://lpo.energy.gov/?page\\_id=45](http://lpo.energy.gov/?page_id=45) (last visited July 25, 2011).

<sup>114</sup> Pub. L. No. 109-58, Title XVII (Aug. 8, 2005).

<sup>115</sup> DOE, Loan Program Office, *Solicitation for Coal-based Power Generation and Industrial Gasification Facilities that Incorporate Carbon Capture and Sequestration or Other Beneficial Uses of Carbon and for Advanced Coal Gasification Facilities*, available at [http://lpo.energy.gov/wp-content/uploads/2010/09/FE\\_Sol9\\_22\\_08.pdf](http://lpo.energy.gov/wp-content/uploads/2010/09/FE_Sol9_22_08.pdf). September 22, 2008

<sup>116</sup> Pub. L. No. 111-5 (Feb. 17, 2009). Specifically, ARRA amended the 2005 Energy Policy Act to include section 1705, which authorizes DOE to guarantee loans for projects using commercial technologies. Commercial technologies had previously been excluded from the LGP.

<sup>117</sup> In total, the Act authorized \$38.5 billion in loan guarantees for different technologies. U.S. Energy Information Agency, *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010* (July 2011), at 64 available at <http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf>.

<sup>118</sup> DOE, Loan Program Office, *Solicitation for Coal-based Power Generation and Industrial Gasification Facilities that Incorporate Carbon Capture and Sequestration or Other Beneficial Uses of Carbon and for Advanced Coal Gasification Facilities*, available at [http://lpo.energy.gov/wp-content/uploads/2010/09/FE\\_Sol9\\_22\\_08.pdf](http://lpo.energy.gov/wp-content/uploads/2010/09/FE_Sol9_22_08.pdf). September 22, 2008

<sup>119</sup> GAO, Department of Energy, Further Actions Are Needed to Improve DOE's Ability to Evaluate and Implement the Loan Guarantee Program, available at <http://www.gao.gov/new.items/d10627.pdf>. July 2010. Appendix V, at 23.

## 2. Standards

Energy procurement standards, such as state renewable energy standards, require particular sectors or entities to ensure that a fixed percentage of their energy comes from a particular source. Unlike government spending, including tax expenditures, which provide a financial incentive, standards constitute a regulatory requirement and thus are excluded from the scope of this study. While standards may affect markets for particular fuel sources, and can be viewed as imposing costs on – or conferring benefits to – particular industries, they do not constitute a cost to the government. Moreover, it is difficult to translate precisely the effect of a standard into a monetary benefit to an industry .

## 3. Regulatory Interventions

This study does not examine the effect of regulation (or a lack of regulation) on energy markets. For example, the Clean Air Act<sup>120</sup> imposes costs on the fossil fuel industry by imposing emission control standards. Any decision not to regulate certain emissions under the Clean Air Act confers a benefit on coal and other energy sectors, but it does not constitute government spending under the study’s “cost-to-government” definition. Nor does this study examine the benefits provided to public health or the commons by regulation or government expenditures.

## 4. Participation in Multilateral Development Banks

The U.S. is a member of various multilateral development banks (MDBs) including the World Bank Group, the Inter-American Development Bank, the Asian Development Bank, the African Development Bank, and the European Bank for Reconstruction and Development (EBRD). These institutions support coal use through direct loans, loan guarantees, development policy lending, and technical support. For example, the World Bank Groups recently approved loans to major coal-fired power plants in South Africa and India.<sup>121</sup> Some observers argue that U.S. contributions to MDB budgets constitute spending that benefits coal.<sup>122</sup>

Although MDB funding supports coal use and U.S. participation in the WBG as well as its International Development Agency contributions result in a cost to government, the U.S. does not have the same degree of control over the funding decision as it does for other forms of direct federal support of coal. As a member of these institutions, the U.S. has effectively delegated decision-making power to the MDB Boards of Directors, which approve institutional energy lending portfolios. While the U.S. has a powerful vote and voice within these boards, its policy preference is

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<sup>120</sup> Clean Air Act of 1963, Pub. L. No. 88-206, 77 Stat. 392 (1963)

<sup>121</sup> International Finance Corporation, FAQ – Tata Mundra Project, [http://www.ifc.org/ifcext/southasia.nsf/Content/TataMundra\\_FAQ](http://www.ifc.org/ifcext/southasia.nsf/Content/TataMundra_FAQ) (last visited July 22, 2011); “World Bank Supports South Africa’s Energy Security Plans,” <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,contentMDK:22534959~pagePK:34370~piPK:34424~theSitePK:4607,00.html> (last visited July 22, 2011).

<sup>122</sup> See Doug Koplow, *ELA Energy Subsidy Estimates: A Review of Assumptions and Omissions*, (March 2010), available at [http://www.earthtrack.net/files/uploaded\\_files/EIA%20subsidy%20review%20final\\_17Mar10.pdf](http://www.earthtrack.net/files/uploaded_files/EIA%20subsidy%20review%20final_17Mar10.pdf); Synapse Energy Economics, Inc., Lucy Johnston et al, Phasing Out Federal Subsidies for Coal, Synapse Energy Economics, Inc. (April 13, 2010), available at <http://www.sierraclub.org/coal/downloads/2010-04-13-FedCoalReport.pdf>. For example, on a bi-annual basis, the U.S. contributes to the International Development Agency, the public lending arm of the World Bank Group which gives concessional loans to the lowest-income countries.

not always controlling. For example, in the most recent WBG voting rounds that considered coal-fired plants, loans were issued notwithstanding the US abstention due to environmental concerns. Beyond expressing concern over specific projects, the U.S. has also called for a policy of diminished support for coal. In 2010, for example, the U.S. called for more stringent World Bank Group lending to coal.<sup>123</sup> For these reasons, ELI considered U.S. support for the WBG as spending that benefited coal for purposes of this study.

## 5. Federal Coal Leasing

With the passage of the Federal Coal Leasing Amendments Act (FCLAA), Congress demanded that federal coal leases be awarded by competitive bidding and garner fair market value.<sup>124</sup> The FCLAA allows a "lease by application" process outside of coal-mining regions, in which lease tracts are requested by mining companies, approved by the Bureau of Land Management (BLM), and subject to competitive bidding. The BLM rejects any bid that falls below the agency's calculated fair market value.<sup>125</sup> This system is in place nation-wide because the BLM no longer classifies any area of the United States as a coal-mining region. Few leases designed in this system receive more than one bid, largely because coal companies typically request "production maintenance tracts" that allow the expansion of operations at an existing mine. The General Accounting Office has recommended that Congress authorize the BLM to negotiate "production maintenance leases, which for all intents and purposes, are noncompetitive."<sup>126</sup> ELI did not include coal leasing in this study of spending that benefits coal because the fair market value requirement indicates Congressional intention to avoid a benefit, even if it may be possible to increase revenue through other systems or styles of implementation.

## 6. Other Programs

### *Environmental Protection Agency, Office of Research and Development*

The EPA's Office of Research and Development (ORD) funds research that supports the EPA's primarily regulatory role to implement federal laws designed to protect human health and the environment. The NRC (2008) estimated ORD's coal-related R&D at \$9.6 million for 2006.<sup>127</sup>

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<sup>123</sup> U.S. Comments on World Bank Energy Sector Strategy Approach Paper, *available at* [http://siteresources.worldbank.org/EXTESC/Resources/US\\_comments\\_on\\_World\\_Bank\\_Energy\\_Sector\\_Strategy\\_Approach\\_Paper.pdf](http://siteresources.worldbank.org/EXTESC/Resources/US_comments_on_World_Bank_Energy_Sector_Strategy_Approach_Paper.pdf).

<sup>124</sup> 30 U.S.C. § 201.

<sup>125</sup> The regulatory definition of "fair market value" does not require the BLM to maximize revenues, but rather to obtain the "amount in cash, or on terms reasonably equivalent to cash, for which in all probability the coal deposit would be sold or leased by a knowledgeable owner willing but not obligated to sell or lease to a knowledgeable purchaser who desires but is not obligated to buy or lease." 43 C.F.R. § 3400.0-5(n). ELI did not evaluate the BLM's methodology for determining fair market value, which is discussed in the agency handbook, *Economic Evaluation of Coal Properties* (available at [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.29194.File.dat/h3070-1.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.29194.File.dat/h3070-1.pdf)).

<sup>126</sup> *See e.g.* S. Comm. on Energy and Nat. Res. (1983), statement of J. Dexter Peach, Director, Resources, Community and Economic Development Division, GAO.

<sup>127</sup> National Research Council. *Coal: Research and Development to Support National Energy Policy*. Washington: Natl. Acad., 2007, at 113. Most ORD research is focused on waste issues (e.g., mercury and other potentially harmful emissions). It also analyzes the environmental problems associated with active and abandoned mines, particularly land reclamation, water quality maintenance, and the proper handling and disposal of the spoils and wastes from mining operations (e.g., mountain top coal mining and coal combustion residues). *Id.* at 154

While ELI included other coal-related R&D identified by the NRC in this report, ORD's work was not included because its research supports government regulatory efforts rather than coal production or use.

## 7. *De Minimis* Tax Expenditures

*Qualified Energy Conservation Bonds* - IRC Section 54D. Congress created this tax credit bond program in 2008, authorizing \$800 million in credits for holders of bonds that finance several kinds of projects, including CCS research. In the 2009 stimulus, Congress expanded authorized expenditures to \$3.2 billion. In the period of this study, no CCS projects were selected to receive tax credits under this program.

*Incentives for Liquid Coal* - IRC Sections 179C and 6426. IRC Section 179C creates a deduction for half the cost of liquid coal refineries and other liquid fuel refineries. Congress created this provision with the Energy Policy Act of 2005. To qualify, refineries must either have been in service or under contract for construction by January 1, 2010. IRC Section 6426 excludes liquid coal and other fuels from the fuel excise tax. From its enactment in 2004 (in the American Jobs Creation Act of 2004) through the end of 2011 it also provided a credit for the sale of liquid coal and other favored fuels. These expenditures were not included in this tally of fiscal impacts because the United States did not produce a significant amount of liquid coal during the 2002-10 study period.

*Clean Renewable Energy Bonds* - IRC Section 54. These tax credit bonds were used to finance facilities that qualify for tax credits under IRC Section 45 - a category that includes Indian coal, refined coal, and an array of renewable energy projects. Congress authorized bond issuance up to \$1.2 billion in the Energy Policy Act of 2005. ELI considered the support for coal *de minimis* because only one of the 913 CREBs issued financed a refined coal project.<sup>128</sup> When Congress created the New CREBs program in the Energy Improvement and Extension Act of 2008 (codified at IRC Section 54C), it excluded Indian coal and refined coal production facilities from eligibility.

*Mine Rescue Team Training Credit* - IRC Section 45N. This section provides a credit for training courses for workers at underground mines. Congress created the credit in 2006 and the JCT estimates that its annual fiscal impact is one million dollars. The provision is set to expire at the end of 2011. The overall cost of this provision is about \$1 million annually.

## IV. Conclusion

This report describes the type and magnitude of federal expenditures that benefit coal over a nine year period. From 2002-10, spending that targeted coal cost the federal government approximately \$25.425 billion. During this period Congress made significant changes in the way the federal government spends funds to benefit coal. The nonconventional fuels tax credit, which was by far the largest expenditure for coal at the beginning of the study period, is no longer available for most types of coal-derived fuels. Toward the end of the study period, the Bailout and ARRA ushered in a new set of expenditures for coal, with an emphasis on CCS. While less than 1/7 of coal spending in 2002-10 supported CCS, one of the most noteworthy trends during that period was the increasing proportion of coal expenditures devoted to CCS research and implementation. It is unclear whether this trend will continue, given the singular nature of the Bailout and ARRA.

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<sup>128</sup> Joint Committee on Taxation, Tax Expenditures for Energy Production and Conservation (April 21, 2009).

Nonetheless, Congress may consider concentrating expenditures in programs that reduce climate change or ease compliance with future carbon reduction treaties.

In addition, the government supported coal through a variety of programs and tax policies that Congress did not specifically intend to benefit coal-related industries. During the study period, the federal government spent an estimated \$3.79 billion on such programs. Due to limited government data, it was not possible to estimate the portion of these tax expenditures that benefited coal mining, processing, and use. Finally, the definition of coal expenditures used for this study excludes a variety of federal policies that provide valuable benefits to coal producers and users.

## Appendix: Methods for Calculating Direct Spending

This Appendix explains the data sources used to quantify the expenditures included in this study. The expenditures examined include: (1) foregone revenues from tax expenditures; and (2) direct spending, including on research and development programs.

### (1) Tax Expenditure Data

The numbers presented for tax expenditures that target or disproportionately support coal come directly from one of the sources listed below, with limited exceptions. For the “non-targeted” spending, ELI used consistent methodology where possible; any alternative sources are noted in footnotes to the relevant text. The following sources provide future projections based on economic modeling and thus are only estimates – the federal government does not make exact, fuel-specific historical tax expenditure data available to the public. For each year of the study period, researchers took data from tax expenditure reports issued closest in time to that year. This means that for Fiscal Year 2002, researchers relied on the Joint Committee on Taxation’s (JCT) *Estimates of Federal Tax Expenditures for Fiscal Years 2001-2005* (JCS 1-01), because no JCT tax expenditure report was issued for the time period FY 2002-2006. Where researchers relied on data from the Office of Management and Budget (OMB) (published in the President’s annual “Analytical Perspectives” section of the Budget) in a given year, the study uses the Budget corresponding to two fiscal years after that year. This is because OMB provides seven-year projections beginning two years before the year of the report. For example, the Fiscal Year 2004 Budget provides tax expenditure data from 2002 to 2009. The study uses that year’s Budget only for the earliest year’s data, i.e., 2002 data. FY 2003 data comes from the 2005 Budget, and so forth.

For several provisions, researchers were required to make calculations from the data because there was not a one-to-one correspondence between the scored tax expenditure and the fuel-specific spending. These include:

- (1) 5-year rolling averages derived from JCT 5-year estimates, where annual numbers for a particular provision are not available because they are *de minimis*;<sup>129</sup>
- (2) the special deductions for mining reclamation reserves under the Surface Mining Control and Reclamation Act (SMCRA) (IRC Section 468), which are also available for clean-up costs at solid waste management sites. Researchers counted half of the 5-year rolling average for this provision as expenditures to benefit coal, believed to be a conservative estimate given the respective tax liabilities associated with coal-mine versus solid-waste sites;<sup>130</sup>
- (3) the amount of the Credit for Production of Nonconventional Fuels (IRC Section 45K) that supported coal in 2002, when the credit was available for a variety of fuel types. ELI

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<sup>129</sup> *De minimis* as defined by the JCT means less than \$50 million per year, an amount that ELI does not treat as *de minimis* for this report. Rolling averages provide the most accurate method of obtaining annual numbers based on available data.

<sup>130</sup> Many solid waste management sites (i.e., landfills) are owned by municipalities or other government units that already receive preferential tax treatment.

estimated that the tax expenditure on coal-related production in 2002 was equal to that in 2003; and

(4) the provision on Expensing Advanced Mine Safety Equipment (IRC Section 179E) applies to underground mines generally. ELI estimated that 80% of this tax expenditure benefits coal mining companies, based on the proportion of underground mines devoted to coal in the United States.

The data for tax expenditures come from three governmental sources, listed in order of preference:

- (i) **Joint Committee on Taxation (JCT) Tax Expenditure Reports.**<sup>131</sup> These are published each year, with the report numbers identified in the far left-hand column of the table along with the fiscal year to which they correspond.<sup>132</sup> The reports provide 5-year projections from the year of publication. As numbers are rounded to the nearest \$100 million, several significant energy tax expenditures either do not show up in these tables, or are footnoted as being less than \$50 million per year. In addition to year-by-year estimates for corporations and individuals (which have been combined), these reports provide a total 5-year estimate. Often a specific number is given for the 5-year total of a particular provision, even though the annual impact of that provision is marked as “less than \$50 million.” In such cases, the 5-year totals from all JCT Annual Reports over a given period can be taken to produce a 5-year rolling average.
- (ii) **JCT Estimated Revenue Effects**, also called **Estimated Budget Effects.**<sup>133</sup> These are published alongside a specific piece of legislation to show how that legislation changes federal revenue from the baseline over a 10-year period projected forward (the baseline assumes that the current law remains in effect over the entire period). They are most helpful for provisions created within the last 10 years, for which it is possible to track the budget impact of all modifications, amendments, and extensions of a provision by adding together the Revenue Estimates for each legislative change. For tax provisions enacted more than 10 years prior to FY 2008, the baseline is lost for at least some portion of the study period; in other words, data are not available on the fiscal impact wrought by the enactment itself as well as any other amendments made 10 years prior to 2008.<sup>134</sup>

Methodologically, then, where both JCT and OMB provide estimates of a tax expenditure, the study used the JCT numbers. Where only OMB has scored a provision, ELI used that number. There is almost certainly not a one-to-one correspondence between these estimates due to the different assumptions and economic models used by OMB and JCT to calculate them, but by

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<sup>131</sup> The JCT Reports are available at <http://www.jct.gov/publications.html?func=select&id=5> (last visited Sept. 23, 2011).

<sup>132</sup> The latest Tax Expenditure Report for the study period, JCS 3-10, for FY 2010-2014, was published on Dec. 21, 2010.

<sup>133</sup> These can be accessed in chronological order at <http://www.jct.gov/publications.html?func=select&id=6> (last visited Sept. 23, 2011).

<sup>134</sup> For a compilation of the revenue estimates of all changes in the tax code by session of Congress, see JCT, *General Explanation of Tax Legislation in the XXXth Congress*, available at <http://www.jct.gov/publications.html?func=select&id=9>.

combining these two sources of information, the study sought to present the most accurate data currently available.

## **(2) Direct Expenditures**

The methods used to calculate the cost to government of selected agency programs are explained here. Methods for agencies not listed below are described in the body of the report. All monetary values were standardized to U.S. 2010 dollars by using the annual Implicit Price Deflators (IPD) for Gross Domestic Product (GDP) provided by the Bureau of Economic Analysis (BEA).<sup>135</sup> ELI used 2005 as the base year for purposes of the IPD for this study. The ratio of the 2010 IPD (110.659) to each year's IPD was calculated. All monetary values were then multiplied by the ratio calculated for their given year. As a result, all real dollars provided in the report can be compared directly.

### **Department of Energy**

ELI analyzed individual programs within DOE's offices and divisions to determine whether these programs constituted subsidies to coal, relying on three primary data sources to assess the goals, primary activities, and focus of each program:

- (1) the joint appropriations committee conference reports for each Fiscal Year (e.g. the Energy and Water, Interior and Environment, and/or Consolidated Act reports), which contain narrative descriptions of the annual funding allocations;
- (2) the office, division, or program website, which provides current and historical budget information and research priorities; and
- (3) each office's annual congressional budget justifications, which delineate the specific aims and methods of each division program for the subsequent fiscal year.

After determining which DOE programs constitute direct spending to benefit coal, ELI collected annual expenditure data. Most of this data was derived from DOE's annual Statistical Table by Appropriation, which includes the yearly line-item appropriations to various agency offices and divisions. The Statistical Table displays the requested appropriation for that fiscal year alongside comparable appropriations from the preceding two fiscal years. As it typically takes the government two years to determine actual expenditure figures, in order to gather data for a particular fiscal year ELI used the Statistical Table for two years after the respective year (e.g., to get FY 2003 data, ELI consulted the relevant data column from the 2005 Statistical Table).

If there was insufficient data in the Statistical Table, researchers consulted the same sources that were used to make the initial determinations about which programs constituted energy subsidies. In some instances, the joint appropriations committee conference reports contained additional details about how the funds were allocated. In others, the agency office website provided supplementary budget framework and/or outlay information. Finally, the congressional budget justifications sometimes contained more detailed information about internal allocations of agency funds.

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<sup>135</sup> See Table 1.1.9 Implicit Price Deflators for Gross Domestic Product, *at* <http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=Y>.

Finally, ELI disaggregated CCS from the total by reviewing each program's budget justification and, in certain cases, webpage explanations. In the case of Congressionally Directed Projects, ELI relied on information provided by the DOE.

### **U.S. Department of Agriculture (USDA), Rural Utilities Service**

To calculate the coal expenditure amounts for the Rural Utilities Service's (RUS) loans to the electricity sector, ELI used spending estimates presented in *Budget of the United States Government*, published by the Office of Management and Budget (OMB), under the Department of Agriculture section of the Appendix.<sup>136</sup> The specific formula used to calculate rates is not available to the public, but according to the Energy Information Administration, the formula balances expected cash flows for loan disbursements, fees, repayments, recovery rates, and default risk.<sup>137</sup> Present values of cash flows are computed with a discount rate equal to the rate for marketable Treasury securities of similar maturity.<sup>138</sup> As with other budgetary estimates in this report, for each year's estimate, ELI used the values reported for that year in the congressional budget request for the budget year two years after the year of interest (i.e., for the 2010 amount ELI referred to FY 2012 *Budget of the United States Government*).

There are several different types of loans with different interest rates and spending rates. Hardship loans support distribution and subtransmission facilities at a fixed interest rate of 5%. Municipal loans support distribution and subtransmission facilities at an interest rate established quarterly by the RUS according to rates available in the market for municipal bonds of comparable maturities. Treasury rate loans support distribution, subtransmission, and renewable generation facilities at an interest rate equal to the daily rate established by the U.S. Treasury. Federal Financing Bank (FFB) guaranteed loans fund distribution, generation, and transmission facilities at an interest rate equal to the daily rate established by the U.S. Treasury plus one-eighth of 1 percent.

The USDA does not specify in its Budget Summaries and Congressional Budget Justifications which loans go to coal projects and which loans go to other energy projects. ELI therefore estimated the portion of spending that benefit coal by multiplying the total spending for rural electricity by the percentage of rural electricity that is derived from coal. According to the National Rural Electric Cooperative Association, 80% of generation from Generation and Transmission (G&T) cooperatives is coal-fired.<sup>139</sup> Not all rural electricity comes from G&T sources, however. When considering all rural electric distribution cooperatives, 58% of all purchased electricity is coal-generated.<sup>140</sup> ELI assumed that RUS loans and subsidies are distributed proportionally among energy sources. Based on this assumption, 58% of total electric loans, as well as 58% of each electric loan program (hardship, municipal, treasury rate, etc.), were treated as coal-related.

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<sup>136</sup> Office of Management and Budget, FY [2004-2012] Budget of the United States Government (2004-2012), *available at* <http://www.gpoaccess.gov/usbudget/>.

<sup>137</sup> Energy Information Administration, Federal Financial Interventions and Subsidies in Energy Markets 2007 86 (2008).

<sup>138</sup> *Id* at 86.

<sup>139</sup> National Rural Electric Cooperative Association, U.S. Co-ops by the Numbers: Infrastructure, Retail Sales and Generation Portfolio, *available at* <http://www.nreca.coop/members/Co-opFacts/Pages/default.aspx>.

<sup>140</sup> National Rural Electric Cooperative Association, Fuel Mix for Distribution Cooperatives Nationwide, *available at* <http://www.nreca.coop/members/Co-opFacts/Pages/default.aspx>.

Administrative costs were also considered to be spending to benefit coal where appropriate. Values for administrative costs were also obtained from the OMB's *Budget of the United States Government* reports. The reported administrative numbers include costs for both the Rural Electrification and Telecommunications Account programs. To disaggregate the administrative costs for Rural Electrification, ELI calculated the proportion of total loan levels that were given to electric loans (the electrification multiplier). This proportion was multiplied by total administrative costs to estimate the electrification administrative costs. Finally, to determine the administrative costs associated with coal only, ELI multiplied the total by the percentage of rural electricity that derives from coal: .58. Total expenditures were calculated by summing administrative costs and total coal subsidies.

The formula for the spending for each fiscal year is:

$(\text{Spending} \times .58) + (\text{administrative costs} \times \text{electrification multiplier} \times .58) = \text{total spending to benefit coal.}$

### **Program support and direction**

For the major programs (DOE, LIHEAP, and RUS) for which ELI used budget justifications to estimate spending amounts, ELI included program direction and administration in the total spending estimates. Using appropriations line-items for program support, program direction, and/or facility construction and capital equipment, ELI prorated the funds that were considered to be used for provisions that benefited coal. ELI first tallied the total appropriations for the office and calculated what percentage they represented of total office appropriations. This percentage of the program support and/or direction appropriations was included as a spending to benefit coal. The following calculation was performed:

$(\text{Cost of office programs that benefit coal} / \text{Overall cost of office})$   
 $\times$   
 $(\text{Program direction, support, and/or facility construction and capital equipment costs}).$