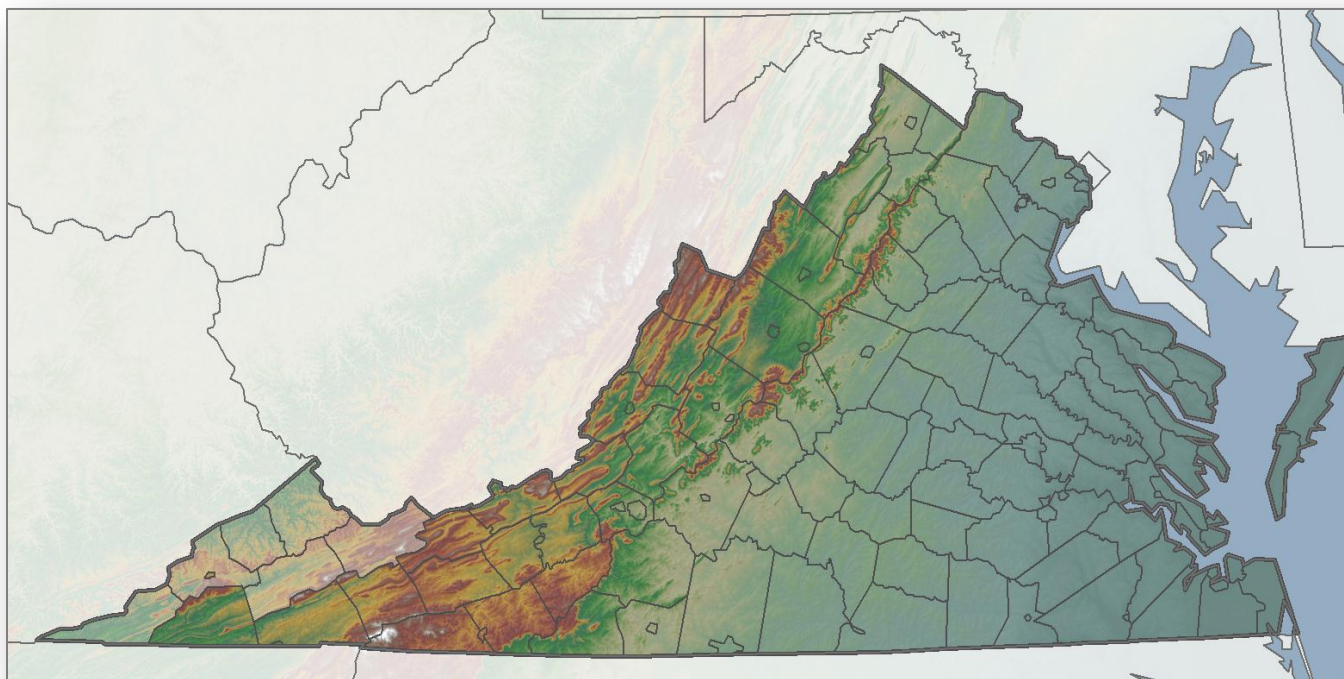


# The Impact of Coal on the Virginia State Budget



**Rory McIlmoil**  
**Laura Hartz**  
**Anne Hereford**  
**Evan Hansen**

**Downstream**  
**Strategies**  
building capacity for sustainability



**December 12, 2012**

**Downstream Strategies**

295 High Street, Suite 3  
Morgantown, WV 26505  
[www.downstreamstrategies.com](http://www.downstreamstrategies.com)

# The Impact of Coal on the Virginia State Budget

Rory McIlmoil, Laura Hartz, Anne Hereford, Evan Hansen

## ABOUT THE AUTHORS

**Rory McIlmoil, M.A., Project Manager, Energy Program, Downstream Strategies.** Mr. McIlmoil has a background in environmental science and policy with a focus on the analysis and presentation of scientific and economic data relevant to environmental policy and energy development. He has four years of experience working on energy and economic policy issues relevant to Central Appalachia.

**Laura Hartz, M.S., Project Manager, Land Program, Downstream Strategies.** Ms. Hartz researches science and policy related to energy, agriculture, and the environment. She brings a strong background in federal policy analysis, technology and sustainability, and natural resource and environmental economics.

**Anne Hereford, M.S., Project Environmental Scientist, Downstream Strategies.** Ms. Hereford has a background in environmental science. Her diverse experience includes work in GIS development, permit research, data analysis, water monitoring, aqueous geochemical modeling, and science education.

**Evan Hansen, M.S., Principal, Energy Program, Downstream Strategies.** Mr. Hansen founded Downstream Strategies and has 20 years of experience as an environmental consultant on energy, greenhouse gas, and water resource issues for nonprofit organizations, government agencies, and private businesses. He has developed and applied computer models; provided training and expert testimony on issues related to environmental laws, policies, and permits; and led multi-disciplinary research teams.

## ABOUT THE PROJECT

In 2009, the Mountain Association for Community Economic Development produced a report titled *The Impact of Coal on the Kentucky State Budget* (Konty and Bailey, 2009). The report analyzed the Kentucky coal industry's net fiscal impact on the state budget by estimating the amount of tax revenues contributed by the industry, as well as the state expenditures associated with supporting the industry and its employees. The report found that the coal industry had a net negative impact on the state budget for Fiscal Year 2006, and concluded that while the coal industry provided significant benefits to the state and local economies in Kentucky, a true accounting of coal's economic impact must also consider the associated costs. For Kentucky, those costs were significant. The report's conclusions raise questions about Kentucky's policies related to energy and economic development, particularly given the realities of a decline in coal production, pending legislation that could reduce the competitiveness of Kentucky coal, and the growing impact of coal on economic, social, and environmental health.

This Virginia report is one of three similar reports for other Central Appalachian states; the other two focus on Tennessee and West Virginia. The goal of these projects is to add to the public dialog so that policymakers at the county, state, and federal level can fairly assess the current benefits and costs of the coal industry and the potential for economic diversification.

## ACKNOWLEDGEMENTS

We would first like to acknowledge the various organizations whose contributions made this report possible. In alphabetical order, these include: Blue Moon Fund; Mary Reynolds Babcock Foundation; Natural Resources Defense Council; Rockefeller Family Fund; Sierra Club; and University of Colorado, Denver, School of Public Affairs—Central Appalachian Prosperity Project.

We greatly appreciate the support of all individuals and groups who have contributed to this effort, and, more broadly, who are committed to sustainable economic development in Central Appalachia. For efforts based in Virginia, we greatly appreciate the assistance provided by Tom Cormons and Mike McCoy of Appalachian Voices, and thank them for their advice and support throughout the project period.

For their time and willingness to assist and advise our research and development of methodology, we would like to thank Melissa Fry Konty and Jason Bailey of the Mountain Association for Community Economic Development. Their research and reporting on *The Impact of Coal on the Kentucky State Budget* served as the inspiration for this report.

We also appreciate the time, information, and expertise provided by various agencies and individuals that make up the government of the Commonwealth of Virginia. These include the Virginia Department of Taxation; Virginia Department of Mines, Minerals and Energy; Center for Economic and Policy Studies—Weldon Cooper Center for Public Service at the University of Virginia; Virginia Auditor of Public Accounts; Virginia Department of Environmental Quality; Virginia Employment Commission; Virginia Department of Forestry; and, the Commissioners of Revenue for the Virginia counties of Buchanan, Dickenson, Lee, Russell, Tazewell and Wise. In addition, we would like to thank the Appalachian field office of the United States Office of Surface Mining Reclamation and Enforcement. Without the assistance of each of these agencies, this report could not have been completed.

## COVER ILLUSTRATIONS

The map on the front cover, produced by Downstream Strategies, depicts the coal-producing counties in southwest Virginia. The coal-producing counties are shaded in light gray. The photo is of the town of Norton in Wise County, Virginia, and was provided courtesy of Marley Green and Southern Appalachian Mountain Stewards.

## SUGGESTED REFERENCE

McIlmoil, Rory; Hartz, Laura; Hereford, Anne; and Evan Hansen (2012) *The Impact of Coal on the Virginia State Budget*. Downstream Strategies. Dec 12.

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>VIII</b>
<b>1. INTRODUCTION</b> .....	<b>1</b>
1.1 THE DECLINING IMPORTANCE OF COAL FOR THE COMMONWEALTH OF VIRGINIA .....	1
1.2 FOCUS AND METHODOLOGY .....	7
1.3 STRUCTURE OF THE REPORT AND INITIAL FINDINGS .....	8
<b>2. DIRECT COAL INDUSTRY: REVENUES</b> .....	<b>9</b>
2.1 SALES AND USE TAXES REMITTED VIA COAL MINING DEALERS .....	10
2.2 CORPORATE INCOME TAX.....	11
2.3 LOCAL COAL-RELATED TAXES AND STATE FUNDING FOR EDUCATION .....	12
2.4 SUMMARY .....	13
<b>3. DIRECT COAL INDUSTRY: ON-BUDGET EXPENDITURES</b> .....	<b>14</b>
3.1 DEPARTMENT OF MINES, MINERALS, AND ENERGY .....	15
3.2 DEPARTMENT OF ENVIRONMENTAL QUALITY.....	17
3.3 DEPARTMENT OF TRANSPORTATION .....	19
3.4 OTHER AGENCY EXPENDITURES .....	22
3.5 ACADEMIC INSTITUTIONS .....	23
3.6 SUMMARY .....	24
<b>4. DIRECT COAL INDUSTRY: OFF-BUDGET EXPENDITURES</b> .....	<b>25</b>
4.1 EXPENDITURES FROM THE CORPORATE INCOME TAX .....	26
4.2 EXPENDITURES FROM THE STATE SALES AND USE TAXES.....	31
4.3 SUMMARY AND ANALYSIS .....	33
<b>5. DIRECT COAL EMPLOYMENT: REVENUES AND EXPENDITURES</b> .....	<b>34</b>
5.1 REVENUES .....	36
5.2 EXPENDITURES .....	41
5.3 SUMMARY .....	42
<b>6. INDIRECT EMPLOYMENT SUPPORTED BY COAL: REVENUES AND EXPENDITURES</b> .....	<b>43</b>
6.1 REVENUES .....	43
6.2 EXPENDITURES .....	45
6.3 SUMMARY .....	45
<b>7. LEGACY COSTS RELATED TO COAL</b> .....	<b>47</b>
7.1 ABANDONED MINE LANDS.....	47
7.2 BOND FORFEITURE SITES.....	49
7.3 SUMMARY .....	49
<b>8. CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>50</b>
8.1 JOBS.....	50
8.2 STATE REVENUES AND EXPENDITURES.....	50
8.3 LEGACY COSTS .....	53
8.4 FUTURE TRENDS.....	53
8.5 RECOMMENDATIONS .....	54
<b>9. KEY RECOMMENDATION: FUNDING ECONOMIC DIVERSIFICATION IN VIRGINIA’S COALFIELD COUNTIES</b> ...	<b>56</b>
9.1 CONTEXT.....	56
9.2 ELIMINATING THE EMPLOYMENT ENHANCEMENT AND COAL EMPLOYMENT AND PRODUCTION INCENTIVE TAX CREDITS .....	58
9.3 DISTRIBUTING THE MAJORITY OF NEW TAX REVENUES TO THE VIRGINIA COALFIELD ECONOMIC DEVELOPMENT AUTHORITY ..	59
9.4 ESTABLISHING A PERMANENT MINERAL TRUST FUND .....	59
9.5 RESULTS.....	60
<b>APPENDIX A : COUNTY-LEVEL COAL-RELATED REVENUE</b> .....	<b>62</b>
<b>APPENDIX B : RIMS-II AND THE USE OF ECONOMIC MULTIPLIERS</b> .....	<b>64</b>
<b>REFERENCES</b> .....	<b>65</b>

## TABLE OF TABLES

Table 1: Direct tax revenues paid by the Virginia coal industry, FY2009.....	9
Table 2: Estimated production value by mining industry, average for 2008 and 2009 .....	10
Table 3: Coal’s average share of non-governmental GDP for 2008 and 2009.....	10
Table 4: Breakdown of state and local funding for education costs in coal-producing counties, 2009 .....	13
Table 5: Estimate of local SOQ education programming costs contributed by coal-related revenues.....	13
Table 6: Department of Mines, Minerals, and Energy coal-related General Fund expenditures.....	17
Table 7: Department of Environmental Quality coal-related General Fund expenditures .....	18
Table 8: Estimating the percent of road use by “coal type” truck for coal-producing counties .....	21
Table 9: Estimating coal-related state Transportation Fund expenditures by county .....	22
Table 10: Estimated net direct impact of the coal industry on the state budget.....	24
Table 11: Off-budget expenditures supporting the Virginia coal industry .....	26
Table 12: Coalfield Employment Enhancement Tax Credit: estimating the FY2009 base credit value .....	27
Table 13: Coalfield Employment Enhancement Tax Credit: estimating the FY2009 employment factor .....	28
Table 14: Estimated value of the Coalfield Employment Enhancement Tax Credit for FY2009 .....	28
Table 15: Estimated value of the Coal Employment and Production Incentive Tax Credit .....	29
Table 16: Estimate of sales and use tax exemptions for coal production and pollution control .....	32
Table 17: Direct coal employment-related revenues .....	36
Table 18: Income tax revenues from direct coal employment, and percent of total state revenues .....	37
Table 19: Transportation taxes and fees paid by Virginia citizens, by source and fund.....	39
Table 20: Calculation of state expenditures supporting direct coal employment.....	41
Table 21: Estimated net impact of direct coal employment on the state budget.....	42
Table 22: RIMS-II multipliers applied to employment and wages .....	44
Table 23: Estimate of individual income tax revenues from indirect employment supported by coal.....	44
Table 24: Indirect coal employment-related revenues .....	44
Table 25: Calculation of state expenditures supporting indirect coal employment.....	45
Table 26: Net impact of indirect coal-related employment on the state budget.....	45
Table 27: Virginia abandoned mine lands by county.....	48
Table 28: Summary of revenues, expenditures, and net impact of coal for FY2009.....	51
Table 29: Permanent mineral trust funds in other producing states .....	60
Table 30: County demographics for coal-producing counties in Virginia, 2009 .....	62
Table 31: Share of county revenues contributed by coal companies, FY2009 .....	63

## TABLE OF FIGURES

Figure 1: Virginia’s coal-producing counties and percent of total production by county for 2008.....	2
Figure 2: United States coal production by major basin, 2008.....	3
Figure 3: Central Appalachian coal production by state, 2008.....	3
Figure 4: Annual coal production in the Commonwealth of Virginia by mine type, 1983-2009 .....	4
Figure 5: Trends in coal employment by mine type and surface mining as percent of total production .....	5
Figure 6: Labor productivity and average coal prices, by mine type, 1983-2009 .....	6
Figure 7: On-budget direct coal industry expenditures.....	15
Figure 8: Total coal distributed and coal distributed by truck in Virginia, 2001-2009.....	20
Figure 9: Direct coal employment and percent of total production from surface mining, 1983-2009 .....	34
Figure 10: Direct coal employment as a share of total county employment for coal-producing counties .....	35
Figure 11: Abandoned mine lands in Virginia .....	49
Figure 12: Summary of the net impact of the coal industry on the Virginia state budget (by category).....	52
Figure 13: Trends in Virginia electric utility demand for coal and Virginia-mined coal, 2001-2010.....	56
Figure 14: Domestic and foreign demand for Virginia coal, 2001-2010 .....	57
Figure 15: Future funding for the Virginia Coalfield Economic Development Authority, 2014-2035 .....	61

## ABBREVIATIONS

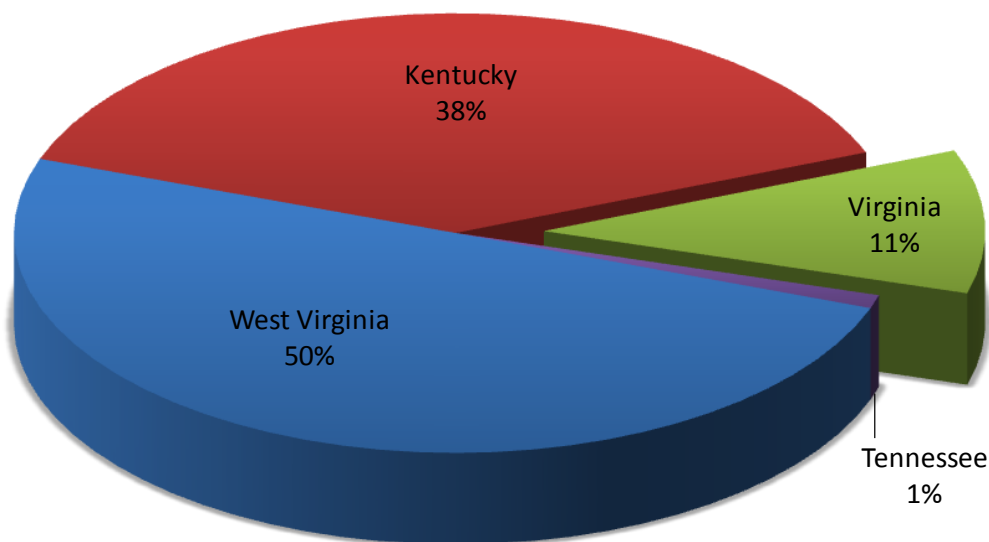
AGI	adjusted gross income
AML	abandoned mine land
ARC	Appalachian Regional Commission
BEA	Bureau of Economic Analysis
BFS	bond forfeiture site
BLS	Bureau of Labor Statistics
DGMR	Division of Geology and Mineral Resources
DGO	Division of Gas and Oil
DLS	Division of Legislative Services
DM	Division of Mines
DMLR	Division of Mined Land Reclamation
DVMT	daily vehicle miles traveled
EIA	Energy Information Administration
ESAL	equivalent single-axle loadings
FY	Fiscal Year
GDP	gross domestic product
GF	General Fund
GVW	gross vehicle weight
HMOF	Highway Maintenance and Operating Fund
ITEP	Institute on Taxation and Economic Policy
JLARC	Joint Legislative Audit and Review Commission
MACED	Mountain Association for Community and Economic Development
MECC	Mountain Empire Community College
MSHA	Mine Safety and Health Administration
NAICS	North American Industry Classification System
NGF	Non-General Fund
OSMRE	Office of Surface Mining, Reclamation and Enforcement
RIMS	Regional Input-Output Modeling System
SMCRA	Surface Mining Control and Reclamation Act
SWCC	Southwest Virginia Community College
TF	Transportation Fund
TMDL	total maximum daily load
TTF	Transportation Trust Fund
TY	Tax Year
US	United States
USGS	United States Geological Survey
VAPA	Virginia Auditor of Public Accounts
VCEC	Virginia Coal and Energy Commission
VACEDA	Virginia Coalfield Economic Development Authority
VDEQ	Virginia Department of Environmental Quality
VCLG	Virginia Commission on Local Government
VDMME	Virginia Department of Mines, Minerals, and Energy
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VDT	Virginia Department of Taxation
VPDES	Virginia Pollutant Discharge Elimination System
VSCC	Virginia State Corporation Commission

## EXECUTIVE SUMMARY

Coal plays a relatively insignificant role in the Commonwealth of Virginia’s overall economy; however, the industry does contribute millions of dollars in state revenue and provides well-paying jobs to thousands of Virginia residents, while providing a substantial portion of county revenues for a few southwestern counties. Despite these benefits, previous accounts of the economic impact of the coal industry for Central Appalachian states have only presented coal’s benefits; our estimates provide an initial accounting of both benefits and costs. Such an accounting is important, for projected declines in production, should they prove accurate, will further diminish coal’s contribution to state revenues, while the negative impacts resulting from coal industry activity will result in ongoing costs to the Commonwealth and its citizens.

Virginia’s coal reserves are situated in the Central Appalachian coal basin, which produced approximately one-fifth of United States coal in 2008. Six of Virginia’s counties produced approximately 25.3 million tons of coal in 2008 and directly employed a reported 4,716 miners, managers, and upper-level staff. Of the coal-producing counties, production in only two of the counties—Buchanan and Wise—accounted for nearly 80% of total state production. Overall, Virginia coal accounted for 11% of all coal mined in Central Appalachia.

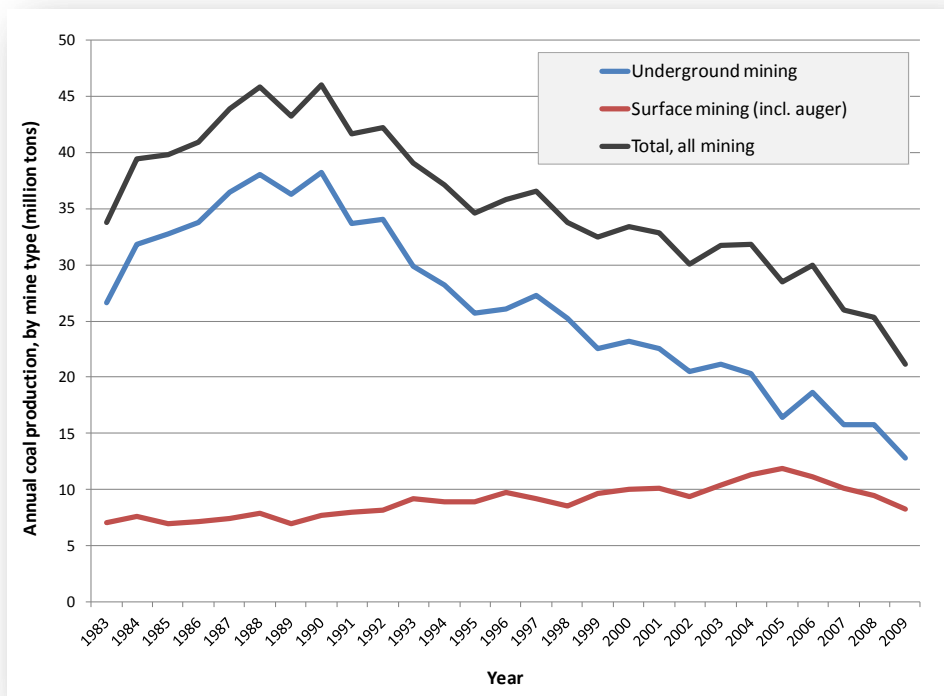
**Figure ES-1: Central Appalachian coal production by state, 2008**



Virginia’s peak coal production occurred in 1990 at nearly 46 million tons, representing 4.5% of total United States production. Since then, Virginia’s share has fallen to 2.2%, and annual production has declined by 45%, largely due to a 60% decline in underground coal production. Production from surface mining—generally the least expensive method of coal mining in Virginia, thereby helping Virginia coal maintain its price competitiveness—has increased by 23% since 1990, but has declined in recent years.



**Figure ES-2: Annual coal production in Virginia by mine type, 1983-2009**



Coal's importance for Virginia is not likely to grow in the future based on the declining competitiveness of Virginia coal resulting from the depletion of the lowest-cost coal reserves. Additionally, new regulations and technology requirements related to air emissions and tighter restrictions on surface mining are also likely to impact Virginia coal production, although to what extent is unknown. Should this occur, coal's contribution to the Commonwealth's budget and state and local economies will likely diminish. This reality raises questions about Virginia's priorities as they relate to economic policy and energy development, particularly for the coal-producing counties of the southwestern region.

In this report, we examine the net impact of the coal industry on the Virginia state budget by compiling data on and estimating both the tax revenues and the expenditures attributable to the industry for Fiscal Year 2009: July 1, 2008 through June 30, 2009. In calculating these estimates, there is an inherent degree of uncertainty associated with the results. We do not claim that our accounting of revenues and expenditures is precise; in fact, we round our estimates so as not to provide a false impression of precision.

**Overall, when taking all revenues and expenditures into account, we estimate that the total net impact of the coal industry on the Virginia state budget in Fiscal Year 2009 amounted to a net cost to the Commonwealth of \$21.9 million.** Examining the impact of the industry and its direct employees alone, and not accounting for tax expenditures, refunded tax credits or the impacts of indirect employment, we estimate a net benefit to the Commonwealth of \$7.0 million. However, including refunded tax credits and indirect employment is necessary for examining the true impact.

It is important to note that the impacts of coal extend beyond traditional accountings of revenues and expenditures. While this report focuses on the industry's net impact on the state budget for a single year, legacy costs resulting from past and future coal industry activity must be considered. These are important both for their potential impact on the availability of funds for various beneficial priorities, and for their future impact on the local and state economies, on the environment, and on the health of Virginia residents.

The following is a summary of findings for each of the revenues and expenditures examined in this report:

**Direct coal industry: Revenues.** The coal industry benefits the state budget through the payment of taxes and fees that contribute to the General Fund, either directly or indirectly. In Fiscal Year 2009, the coal industry provided an estimated \$8.5 million in revenues from the sales and use and corporate income taxes. In addition, local mineral property taxes paid by coal companies reduced demand on state funds for educational programming to the amount of \$6.6 million, bringing the total benefit of the coal industry to the state General Fund to approximately \$15.1 million. In total, coal industry contributions to the General Fund amounted to approximately 0.1% of total state-generated revenues. Based on a lack of coal-specific transportation-related taxes, we do not estimate the industry's contributions to the Transportation Fund.

**Direct coal industry: On-budget expenditures.** The Virginia state budget includes a variety of expenditures that exist only because of the Commonwealth's coal industry. We focus on coal-related expenditures that are paid for with general revenue and transportation funds. These include, for example, units of government within the Department of Mines, Minerals, and Energy, as well as expenditures for the repair of the Commonwealth's coal haul roads. We estimate that on-budget coal-related expenditures amounted to approximately \$11.2 million for Fiscal Year 2009. Comparing only the on-budget expenditures to the direct revenues generated by the industry, we estimate that the coal industry directly resulted in a net benefit to the state budget of approximately \$3.9 million in Fiscal Year 2009.

**Direct coal industry: Off-budget expenditures.** In addition to on-budget expenditures, we estimate off-budget expenditures in the form of tax expenditures. Typically, tax expenditures are foregone revenues resulting from the provision of tax exemptions, credits, and reduced or preferential tax rates. As such, these expenditures result in a loss of tax revenue to state government, thereby reducing the funds available for other government programs and services. We estimate that total tax expenditures provided to the coal industry amounted to \$37.4 million in Fiscal Year 2009. Only two expenditures—the Coalfield Employment Enhancement and Coal Employment and Production Incentive tax credits—accounted for 86% of the total tax expenditure for supporting the coal industry. Importantly, the impact of tax expenditures on the state budget are already largely accounted for as foregone revenues. Therefore, in our calculation of the net impact of the coal industry we include only the portion of the expenditures that was refunded to coal companies as a result of the credit value exceeding company tax liabilities. This cost amounted to \$14.2 million in Fiscal Year 2009.

Tax credits and exemptions represent an unnecessary cost to Virginia's taxpayers given that tax rates have little or no impact on coal production. This is primarily due to the fact that taxes represent only a small portion of the overall cost of doing business, and further, that market forces have a greater effect on coal production and employment than do tax credits and tax rates. For the most part, tax expenditures supporting the Virginia coal industry result in tens of millions of dollars in foregone revenue. However, due to a provision allowing coal companies to be refunded a portion of the value of certain tax credits if the value of the credits exceeds a company's tax liability, some tax credits also result in a direct cost to the state and its taxpayers.

**Direct coal employment: Revenues and expenditures.** While the coal industry generates business-related tax revenues for the Commonwealth associated with the mining of coal, the state budget also benefits through the collection of taxes paid by those directly and indirectly employed as a result of the Virginia coal industry. Therefore, a complete accounting of the impact of the coal industry on the state budget requires a calculation of the revenues and expenditures associated with coal-related employment. Approximately 4,649 Virginia residents were directly employed in the coal industry in Fiscal Year 2009 (slightly lower than the 4,716 reported coal mining employees in 2008). We estimate that total tax revenues related to direct employment in the coal industry amounted to \$23.1 million. However, state expenditures to support those employees amounted to approximately \$20.0 million. Therefore, we estimate that tax benefits for the state budget contributed by direct employees of the coal industry exceeded state expenditures for supporting those employees by approximately \$3.1 million.

**Indirect employment supported by coal: Revenues and expenditures.** When discussing the total economic impact of any industry, it is necessary to include not only the direct impacts in terms of employment, tax revenues, and expenditures, but also the indirect and induced impacts of the industry. The coal industry, like other industries, relies on other companies and generates economic activity and employment. To calculate the indirect impacts, we used the Regional Input-Output Modeling System economic impact multipliers for the coal industry in Virginia. For Fiscal Year 2009, we estimate that indirect employment attributable to coal industry activity generated approximately \$38.3 million in state revenues. However, state expenditures to support those employees amounted to approximately \$53.5 million. We therefore estimate that employment indirectly supported by the Virginia coal industry resulted in a net cost of approximately \$14.7 million for Fiscal Year 2009.

**Legacy costs related to coal.** While this report focuses on the impacts of the coal industry and its employees on the state budget, there are certain legacy costs that will continue to require funding long into the future. For example, in Virginia, as in other Appalachian states, there are numerous abandoned mine lands that have yet to be reclaimed despite decades of federal funding dedicated to that purpose. For Virginia, there have been 2,894 abandoned mine land sites identified, totaling 76,787 acres, of which only 22% have been reclaimed. While \$159.2 million had been spent to complete projects through September 2009, an additional \$436.8 million of work is required to reclaim the remaining sites. These legacy sites present a liability for the coal industry. Because the main funding mechanism in place to reclaim these sites is insufficient and scheduled to end in 2022, action is needed to ensure that reclamation is completed and that the costs are not shifted to taxpayers. If no action is taken, then the Virginia state budget could face additional expenditures in the future to finish the job of reclaiming these legacy sites.

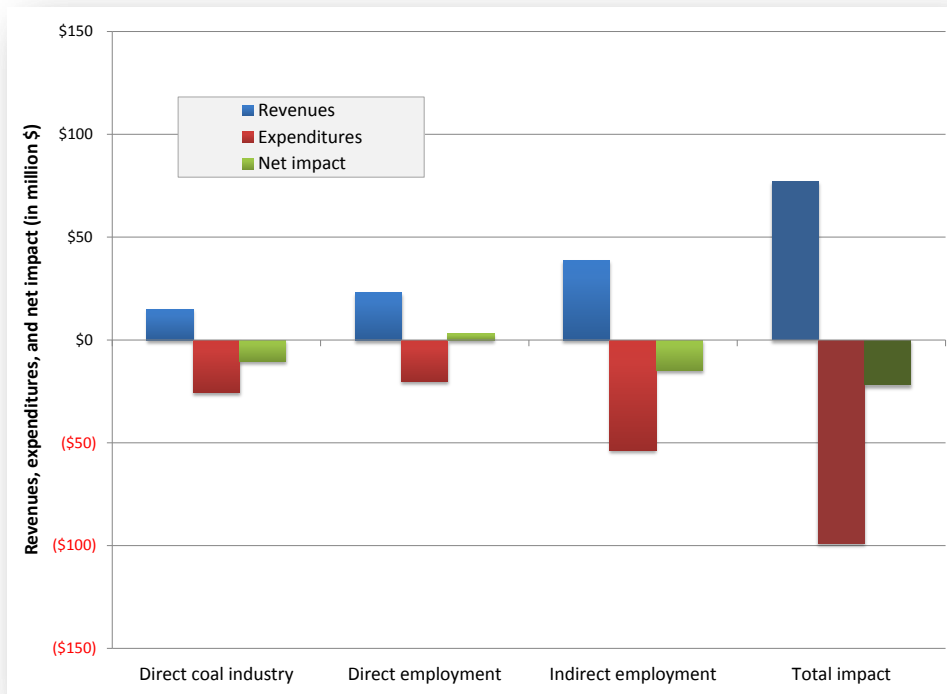
**Conclusions and recommendations.** Every job and every dollar of revenue generated by the coal industry provides an economic benefit for the Commonwealth of Virginia and the counties where the coal is produced; however, the net impact of the Virginia coal industry, when taking all revenues and expenditures into account, amounted to a net cost to the Commonwealth of \$21.9 million in Fiscal Year 2009.

While this number is a reasonable and plausible first approximation, it cannot be represented as a precise calculation. However, the estimates provided in this report are based on the data that are available, and provide a useful first step toward considering not just the industry's revenues, but its costs as well.

**Table ES-1: The estimated impact of the coal industry on the Virginia state budget (detail)**

Item	General Fund	Transportation Fund	Total
<b>Direct coal industry</b>			
Revenues	\$15,050,000	\$0	\$15,050,000
On-budget expenditures	(\$9,650,000)	(\$1,500,000)	(\$11,150,000)
<b>Estimated net impact</b>	<b>\$5,400,000</b>	<b>(\$1,500,000)</b>	<b>\$3,900,000</b>
Coal tax credit refunds	(\$14,200,000)	not calculated	(\$14,200,000)
<b>Total net impact, direct coal industry</b>	<b>(\$8,800,000)</b>	<b>(\$1,500,000)</b>	<b>(\$10,300,000)</b>
<b>Direct coal employment</b>			
Revenues	\$20,190,000	\$2,940,000	\$23,130,000
Expenditures	(\$17,080,000)	(\$2,940,000)	(\$20,020,000)
<b>Estimated net impact</b>	<b>\$3,110,000</b>	<b>\$0</b>	<b>\$3,110,000</b>
<b>Indirect employment supported by coal</b>			
Revenues	\$30,980,000	\$7,850,000	\$38,830,000
Expenditures	(\$45,660,000)	(\$7,850,000)	(\$53,510,000)
<b>Estimated net impact</b>	<b>(\$14,680,000)</b>	<b>\$0</b>	<b>(\$14,680,000)</b>
<b>Total</b>			
Revenues	\$66,220,000	\$10,790,000	\$77,010,000
Expenditures	(\$86,590,000)	(\$12,290,000)	(\$98,880,000)
<b>Estimated net impact</b>	<b>(\$20,370,000)</b>	<b>(\$1,500,000)</b>	<b>(\$21,870,000)</b>

**Figure ES-3: Net impact of the coal industry on the Virginia state budget (summary, by category)**



The process of thinking through the revenues and expenditures as they pertain to the coal industry, and the provision of these initial estimates, is of benefit for state policymakers in that it offers a better understanding of the role of the coal industry at the state level. We encourage the generation of additional data and the calculation of refined estimates to help move this dialog forward.

The following policy recommendations address the direct and indirect costs attributable to coal industry activity in Virginia, with the overall goal being to ensure that the costs are covered through revenues collected from the industry rather than being paid for by the public.

- Eliminate the Coalfield Employment Enhancement and Coal Employment and Production Incentive tax credits.
- Increase funding for the Virginia Coalfield Economic Development Authority and expand the organization's scope of work related to economic diversification.
- Create a Permanent Mineral Trust Fund, similar to such funds that are in place in many western states such as Wyoming and New Mexico, and invest the revenues in economic development.
- Ensure that funds for reclamation and water treatment of abandoned mines are sufficient for meeting all present and future needs.
- Require responsible fiscal accounting to better inform governmental budgetary decision-making.

Overall, state policy related to energy and economic development—to the extent that it supports the coal industry—should be reconsidered, and new policies should be enacted that reflect a recognition of these realities. In Section 9, we detail, analyze, and project the financial benefits of a combined policy recommendation consisting of: (1) eliminating the Employment Enhancement and Coal Employment and Production Incentive tax credit, (2) distributing the majority of the new corporate income tax revenues to VACEDA, and (3) using the remaining revenues to establish a permanent mineral trust fund. We recommend this approach because as coal production in Virginia declines in the future, the potential loss of state revenues will make it even more difficult to cover the annual and legacy costs of coal while also supporting economic diversification strategies for southwest Virginia's coal-producing counties.

# 1. INTRODUCTION

Coal plays a relatively insignificant role in the overall economy of the Commonwealth of Virginia; however, the industry contributes millions of dollars in state and local revenue and provides well-paying jobs to thousands of Commonwealth residents. Traditional accountings of the industry's impact on state economies in Central Appalachia have only presented coal's benefits; our estimates provide an initial accounting of both benefits and costs. Such an accounting is important, for projected declines in production, should they prove accurate, will further diminish coal's contribution to employment and state revenues. However, the negative impacts resulting from coal industry activity will continue, resulting in ongoing costs to the Commonwealth and its citizens.

This report is one of a series of reports on the Central Appalachian states of Kentucky, Tennessee, Virginia, and West Virginia. The structure of the report is modeled after a similar report for Kentucky released by the Mountain Association for Community Economic Development (MACED), which examined the coal industry's impact on the Kentucky state budget (Konty and Bailey, 2009), as well as previous reports on West Virginia (McIlmoil et al., 2010a) and Tennessee (McIlmoil et al., 2010b) released by Downstream Strategies.

It should be noted that while this report is being released during the 2012 Fiscal Year (FY), the report focuses on the impact of the coal industry on the Virginia state budget for FY2009—three years prior to the publication date. This is the result of the unavailability of key FY2009 data until as late as October 2011. Analyzing a more recent FY was not possible without making numerous additional assumptions based on recent trends.

## 1.1 The declining importance of coal for the Commonwealth of Virginia

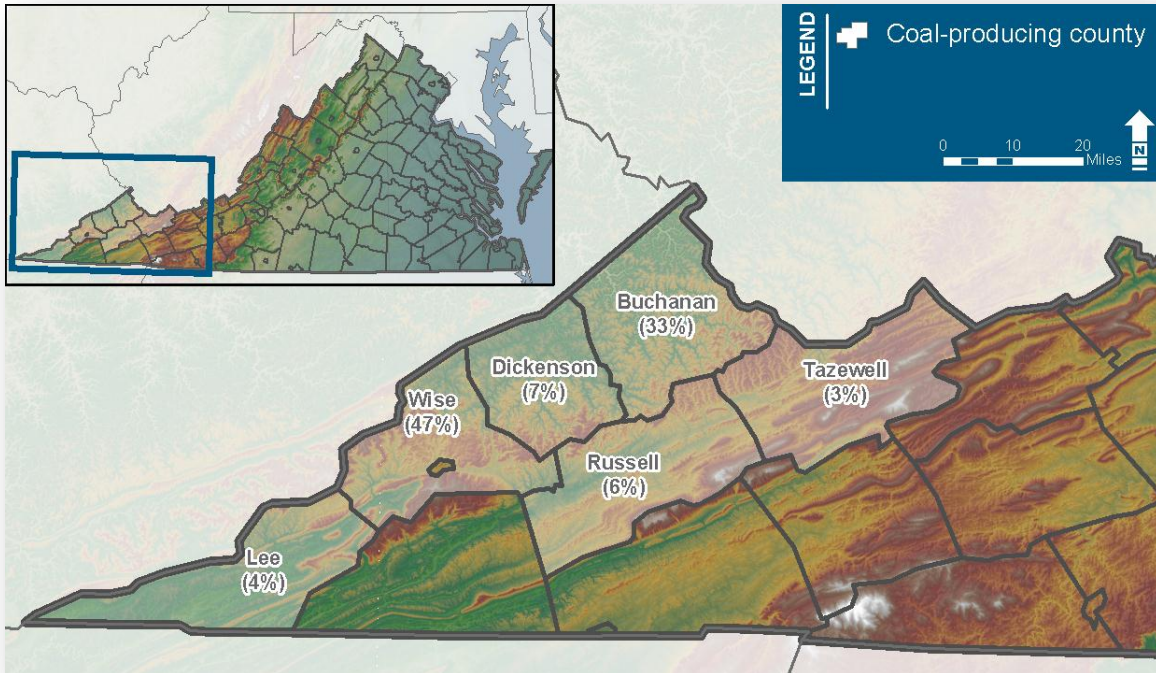
Virginia's coal reserves are situated in the Central Appalachian coal basin, which is characterized primarily as high energy content, low-sulfur bituminous and sub-bituminous coal. According to the federal Office of Surface Mining, Reclamation and Enforcement (OSMRE), these qualities have "historically made Virginia coal attractive for metallurgical coke production and the export market" (OSMRE, 2009a, p. 3). The federal Energy Information Administration (EIA) estimates that Virginia has 735 million tons of recoverable reserves of coal and 296 million tons of recoverable coal reserves at actively producing mines (EIA, 2010a). At 2008 production rates, that is enough coal to last for approximately 12 years without opening any new mines.<sup>1</sup>

According to the federal Mine Safety and Health Administration (MSHA), six of the Commonwealth's ninety-five counties produced coal in 2008, totaling 25.3 million tons of coal production. These counties employed 4,716 miners, managers, and upper-level staff (MSHA, 2010). Of the coal-producing counties, only two accounted for nearly 80% of total state production: Buchanan County (33%) and Wise County (45%).

---

<sup>1</sup> In this section, production and employment values are presented using 2008 data instead of 2009 data. This is because 2009 levels were strongly impacted by the economic recession and do not reflect normal levels. The charts, however, show values through 2009.

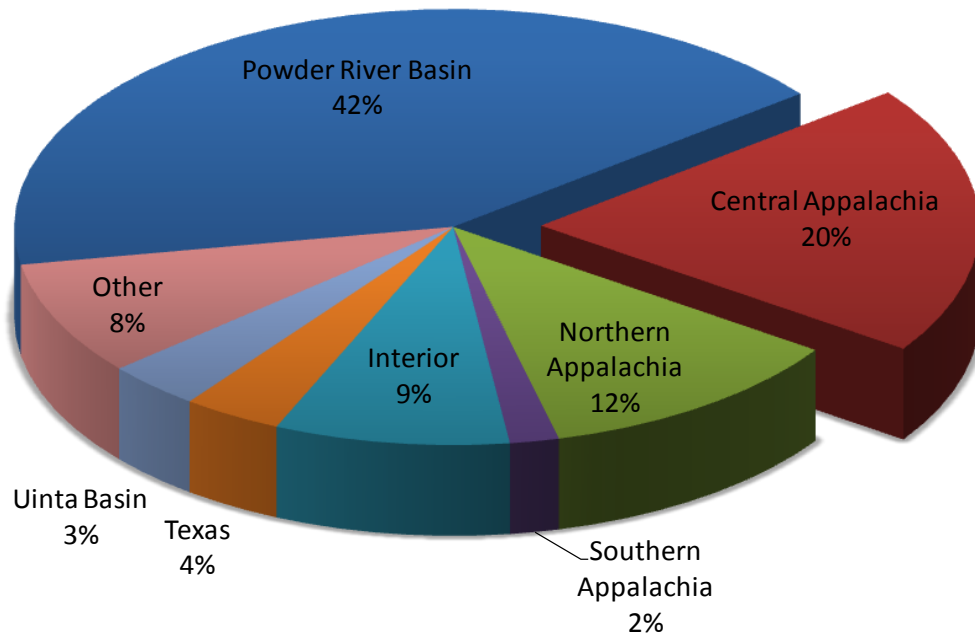
**Figure 1: Virginia's coal-producing counties and percent of total production by county for 2008**



Source: MSHA (2010). See Footnote 1.

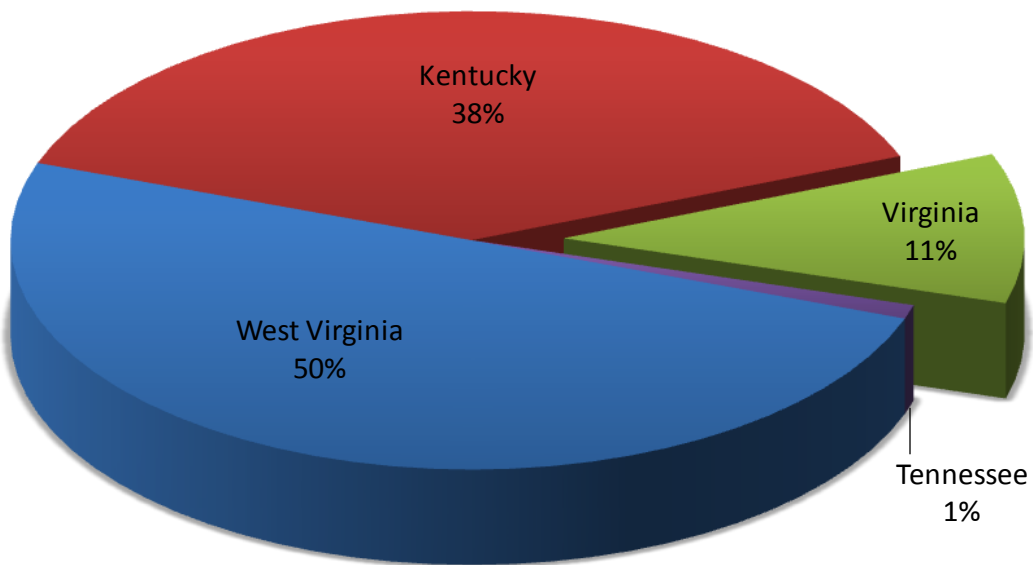
To put Virginia coal production into perspective, in 2008, the Central Appalachian coal basin accounted for 20% of total coal production in the United States (US) (see Figure 2). Of the 234.6 million tons of coal produced in the basin, Virginia contributed 25.3 million tons, or approximately 11% of the total (see Figure 3). Overall, Virginia accounted for approximately 2% of all coal produced in the US in 2008.

**Figure 2: United States coal production by major basin, 2008**



Source: MSHA (2010). See Footnote 1.

**Figure 3: Central Appalachian coal production by state, 2008**



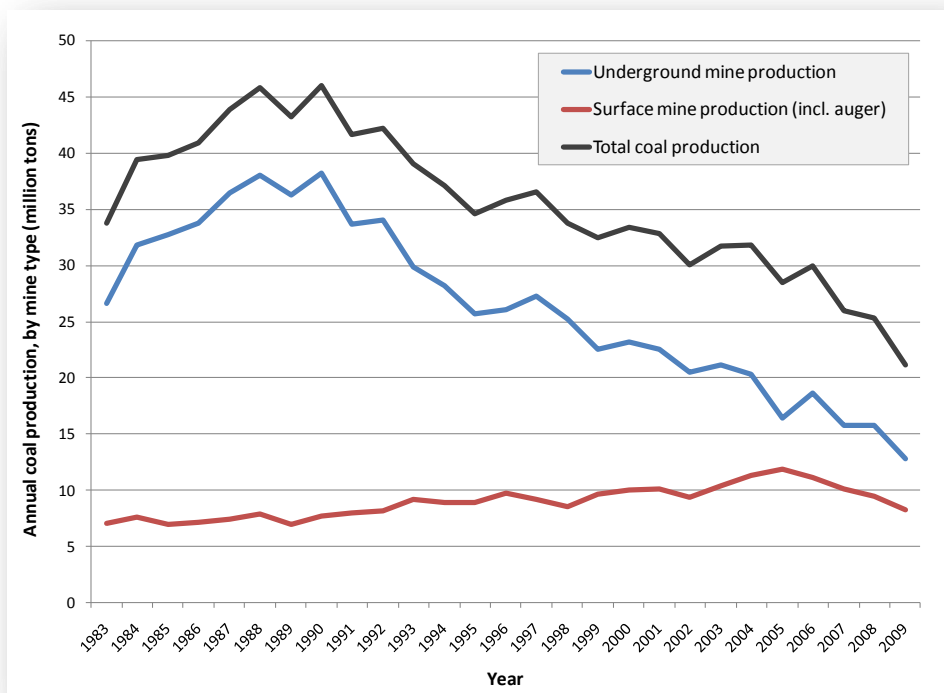
Source: MSHA (2010). See Footnote 1.



Of the coal produced in Virginia, approximately 11 million tons were exported domestically to 18 states in 2008; exports to only three states—Georgia, Tennessee, and North Carolina—accounted for approximately 60% of the total (EIA, 2010b). In the same year, approximately 6 million tons were exported internationally (EIA, 2010c). In total, Virginia exported approximately 17 million tons of coal in 2008, accounting for nearly 70% of total state coal production. The state also imported over 6 million tons of coal in the same year (EIA, 2010b), primarily for electricity generation.

Virginia’s peak in coal production occurred in 1990 at nearly 46 million tons, representing 4.5% of total US coal production. Since then, Virginia’s share has fallen to 2.2% (MSHA, 2010), and net annual production has declined by 45%, largely due to a 60% decline in underground coal production. Surface mining—generally the least expensive form of coal mining in Virginia, thereby helping Virginia coal maintain its price competitiveness—has increased by 23% overall since 1990, but has declined in recent years. The overall decline in production, then, suggests that the growing reliance on surface mining to remain price-competitive with other coal basins has failed to maintain Virginia’s production levels (Figure 4).

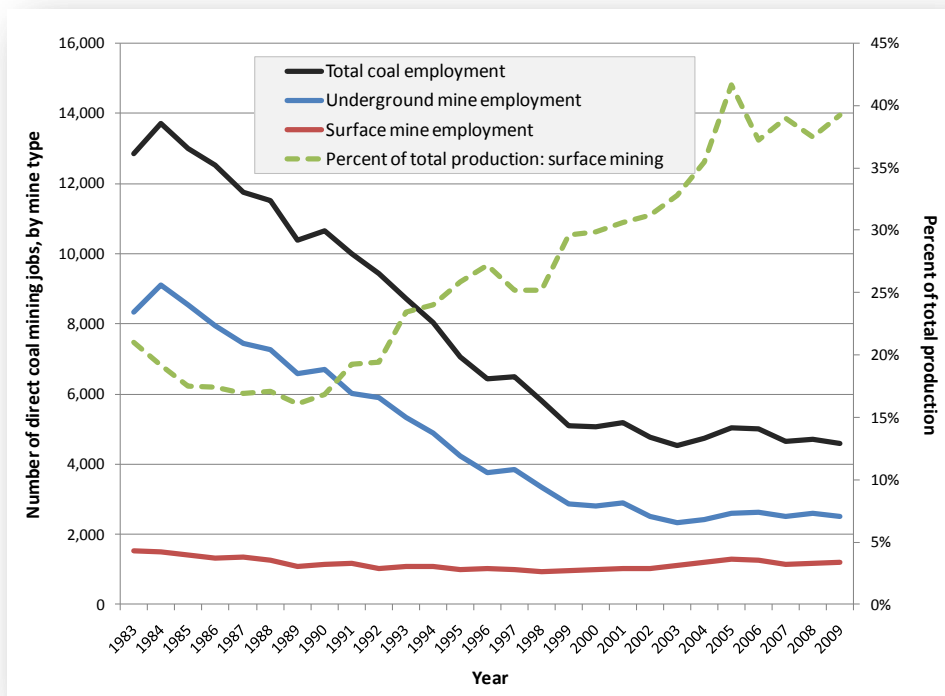
**Figure 4: Annual coal production in the Commonwealth of Virginia by mine type, 1983-2009**



Source: MSHA (2010). See Footnote 1.

Due in part to a substantial shift of production methods from underground to surface mining, direct coal employment in Virginia fell by 65% between 1983 and 2003 to a low of 4,535 employees at the end of this 20-year span (Figure 5); declines in underground mining accounted for 94% of the drop in employment levels. Since 2003, employment has rebounded slightly, increasing to 4,716 in 2008, with gains at underground mines accounting for 78% of this increase.

**Figure 5: Trends in coal employment by mine type and surface mining as percent of total production**



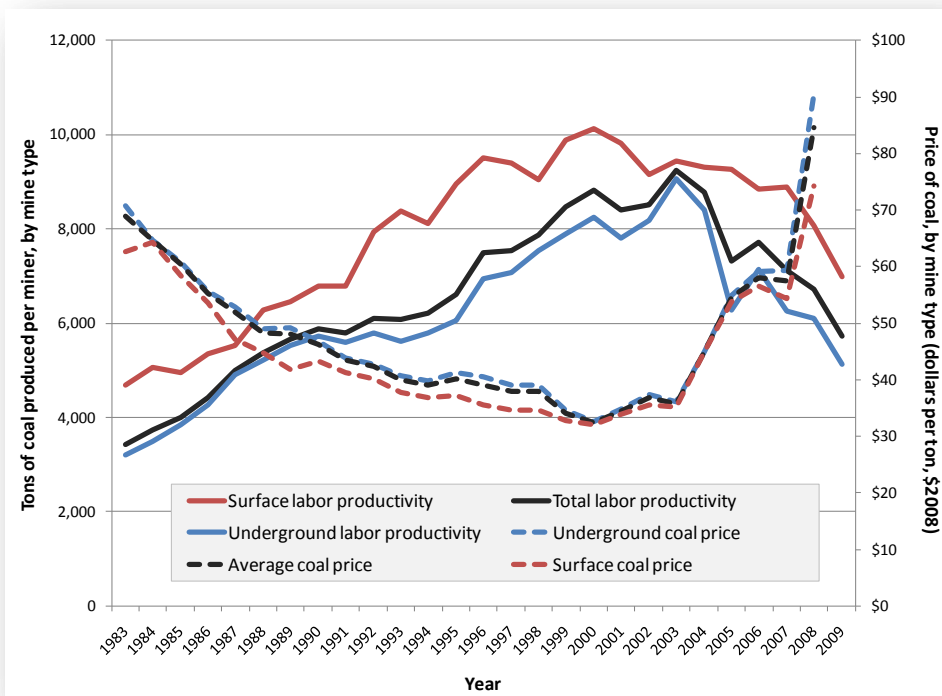
Source: MSHA (2010). See Footnote 1.

The steady decline in Virginia coal production between 1990 and 2000 occurred even as nominal mine sales prices for both surface and underground coal remained relatively stable (as shown in Figure 6, real prices actually declined over this time period) (EIA, 2009). Between 2000 and 2008, the real price of surface-mined coal (in 2008 dollars) rose by 70%, while the real price of underground-mined coal rose by 82%. The sharp rise in coal prices is largely the result of increased production costs for both mining types, which, in turn, is largely due to sharp declines in labor productivity, represented here as tons produced per miner.

As shown in Figure 6, the onset of the price increase for Virginia coal closely corresponds with the beginning of the decline in labor productivity for both mining types. This pattern is significant because trends in labor productivity provide an indication of the accessibility and therefore the economic recoverability of the coal seams (McIlmoil and Hansen, 2010). For Virginia coal mines, labor productivity for surface mining peaked in 2001, and productivity for underground mines peaked in 2003 (Figure 6). Productivity for both mine types has declined sharply since their respective peak years, and this has had an impact on the price and competitiveness of Virginia coal. Average labor productivity has declined by 27% since peak productivity in 2003, while the average price of coal has increased by 61%, rising by \$21.70 per ton over five years.

As an illustration of the impact the rising price of Virginia coal has had on demand for (and therefore, production of) Virginia coal, the rate of decline in production in the five years between 2003 and 2008 was triple the average rate of decline during the previous five years (1998-2003) and double the average rate of decline during the previous ten years (1993-2003) (see Figure 6).

**Figure 6: Labor productivity and average coal prices, by mine type, 1983-2009**



Note: Labor productivity calculated using data for production and employment from MSHA (2010). Weighted coal prices were generated using data for price and total production by mine type and by region for 1983-2008, as reported by EIA (2009; 2010d and e).

In summary, coal’s importance for the Commonwealth of Virginia has diminished and is not likely to grow in the future. Virginia coal is simply not critical for electricity generation in the state—serving as the fuel for only 16% of total electricity demand (MSHA, 2010; EIA, 2010b; EIA, 2010f). Nor is the coal industry vital for the state economy as a whole, although local economies like Wise and Buchanan counties still rely on coal as a significant source of jobs and tax revenue. However, these two counties, which account for approximately 80% of total state coal production, are designated as “At Risk” counties by the Appalachian Regional Commission (ARC). ARC reports a poverty rate for both counties at over 160% of the US average as of 2000 (ARC, 2010). As coal production declines in the coming years, the economic status of these counties may only worsen unless there is a strong shift in state and local policy and economic development planning.

EIA projects that annual Central Appalachian coal production will decline by 52%, or 122 million tons below 2008 levels by 2015, largely as a result of rising production costs associated with declines in labor productivity (EIA, 2010g). Given that Virginia coal production has been steadily declining over time, it is difficult to assess the extent to which the recent price increase has impacted coal production levels. However, the rise in prices has likely heightened the competitiveness of other coal basins and fuels such as natural gas; this trend could result in further declines in production in the coming years and decades.

Should Virginia coal production decline proportionately to projected regional declines, this would amount to a decline of 12.4 million tons by 2015. Implementation of climate legislation and the Cross-State Air Pollution Rule, tighter restrictions on mercury emissions, regulations on coal combustion waste, and stronger restrictions on valley fills from surface mining would all add to the decline in Virginia coal production. Should these occur, coal’s contribution to the state budget and state and local economies would likely diminish. This reality raises questions about the Commonwealth of Virginia’s priorities as they relate to economic policy and energy development, particularly for the coal-producing counties in the southwestern region of the state.

## 1.2 Focus and methodology

In this report, we examine the net impact of the coal industry on the Virginia state budget by compiling data on and estimating both the tax revenues and the expenditures attributable to the industry for FY2009, which covers the period between July 1, 2008 and June 30, 2009. Whenever possible, we replicate the methodologies used by MACED's Kentucky report (Konty and Bailey, 2009) and Downstream Strategies' West Virginia (McIlmoil et al., 2010a) and Tennessee (McIlmoil et al., 2010b) reports in order to generate a degree of consistency across each of the four reports. However, absolute consistency is difficult to achieve given the differing structures of the states' budgets, the types of revenues and expenditures that exist, and the availability and accessibility of necessary data and information. Where previous methodologies are not applicable or where the data are limited, we construct the best possible methodology for estimating revenues or expenditures with available resources.

In calculating estimates for the items considered in this report, there is an inherent degree of uncertainty. We do not claim that our accounting of revenues and expenditures is precise; in fact, we round calculation-based estimates so as not to create a false impression of precision. While these estimates certainly can and should be refined, they still provide an important starting place to examine the industry's costs and benefits.

In general, budget appropriations determine which programs, initiatives, and projects will receive state funding. More specifically, legislators distribute funds from the Virginia state budget based on politically and economically determined priorities, thereby impacting economic development in the Commonwealth, availability of educational opportunities, distribution and quality of infrastructure, and development of energy resources. As state revenues increase, more funds are available for supporting a wider variety of priorities; conversely, as revenues decline, funding for certain projects and services may be eliminated. Should the latter occur, legislators must determine the Commonwealth's true needs and priorities and generate new sources of revenue in order to maintain at least a minimum level of funding for vital social, environmental, and economic programs.

The need to ensure the availability of funds for vital programs is an important consideration when examining the net impact of a particular industry, and when determining whether support for the industry results in a net positive or negative impact on the state budget. In examining the net impact of the coal industry on the Virginia state budget, we focus primarily on revenues and expenditures that are part of the General Fund (GF) and the Transportation Fund (TF). We exclude non-discretionary funds that are earmarked for a specific purpose and only consider those that are applicable to the coal industry and its direct and indirect employees. We choose to focus on these two funds because they include revenues and appropriations from general state tax sources, while excluding revenues and appropriations from dedicated taxes and fees, federal revenues, and all other departmental revenue streams. This limitation allows us to accurately estimate the net impact of coal by excluding flows of money that (1) do not originate from the collection of general taxes applicable to all industries or citizens operating or living in the Commonwealth and (2) are not expended on pre-determined priorities.

It is important to note that we only estimate the revenues generated for the Virginia budget that are directly attributable to coal; we do not estimate the indirect fiscal impact of the coal industry, represented by revenues contributed by the industries that supply coal companies with machinery, tools, equipment, or engineering services. These industries are indirectly supported in part by the existence of the coal industry, and they provide revenue for the state budget. Were we to estimate these indirect benefits, we would then have to generate estimates for the on- and off-budget expenditures of state funds for supporting and regulating the supply industries as well. For the purpose of concentrating our analysis on the fiscal impact of the industry itself, we choose to focus only on the coal industry's direct impact.

However, for coal-related employment, we do estimate the fiscal impact of both direct coal employees—those working directly for the coal companies—and of indirect coal-related employment—or, employment that is indirectly supported by coal industry activity, such as in supply industries. The reason for including state expenditures for supporting coal-related employees in our analysis was to assess both the benefits and costs of such employment. Further, the reason for examining the impact of indirect employment is because traditional accountings of the jobs supported by coal include both the direct and the indirect jobs, and it is therefore necessary to provide an accounting of both the revenues and state expenditures associated with indirect coal-related employment.

Finally, the present report excludes an analysis of the impact of the coal industry on county budgets; however, we do provide an initial accounting of county-level coal-related revenues in Appendix A.

### **1.3 Structure of the report and initial findings**

The body of this report is divided into five main chapters, each focused on a separate type of revenue or expenditure. These include:

- direct revenues generated by the coal industry from taxes and fees;
- on-budget expenditures supporting the coal industry, representing expenditures by state agencies that support and/or regulate the coal industry as well as transportation-related expenditures;
- off-budget expenditures supporting the coal industry in the form of tax credits and exemptions;
- revenues and expenditures related to direct coal industry employment; and
- revenues and expenditures related to employment indirectly supported by the coal industry.

In general, we find that the relative importance of the coal industry to the state budget and economy is not substantial: The industry directly accounted for less than 0.1% of state-generated revenues and approximately 0.1% of total employment in FY2009. These contributions are likely to decline in the near future should official projections of a decline in Central Appalachian coal production prove accurate (EIA, 2010g). Further, we find that the industry imposed a net cost on the Virginia state budget of approximately \$21.9 million for FY2009.

Finally, it is important to note that the impacts of coal extend beyond traditional accountings of revenues and expenditures. While the focus of this report is on the industry's net impact on the state budget for a single year, legacy costs resulting from past and future coal industry activity must also be considered. Understanding these costs is important because of their potential impact on the availability of funds for various beneficial priorities, and because of their future impact on local and state economies, the environment, and the health of Virginia residents. In Section 7, we analyze the legacy costs related to the reclamation of abandoned mine lands (AMLs) and bond forfeiture sites (BFSs) and the restoration and treatment of streams impacted by mining.

In MACED's words, "decisions, especially concerning public policy and the investment of public dollars to meet energy and economic challenges, should be made based on a clear understanding of the full costs and benefits of the alternatives before us" (Konty and Bailey, 2009, p. 7). This report aims to help develop that understanding for the Commonwealth of Virginia and to inform future policy related to energy and economic development.

## 2. DIRECT COAL INDUSTRY: REVENUES

The coal industry generates revenue for the Virginia state budget through the payment of taxes that contribute to the GF and TF. Coal contributes to the GF through the sales and use tax and corporate income tax. The industry also contributes revenue to the TF through the payment of general transportation-related taxes and fees, although there are no coal-specific transportation taxes on the state level; all such TF revenues from coal are captured in our estimates of employment-related revenues in Sections 5 and 6.

Coal companies also contribute to the Non-General Fund (NGF) and to individual agency budgets through the payment of other taxes and fees, including coal truck permit fees. However, because the General Assembly may only make discretionary appropriations from the GF, NGF revenues and expenditures are excluded from this analysis. The industry generates additional revenue for city and county budgets; these revenues are considered in Appendix A.

**We estimate that the coal industry directly contributed approximately \$8.5 million to Virginia’s GF in FY2009, accounting for less than 0.1% of total GF revenues (see Table 1). This total consisted of \$6.4 million in sales and use tax remittances and \$2.1 million in corporate income tax payments.**

**Table 1: Direct tax revenues paid by the Virginia coal industry, FY2009**

Revenue	Amount	Percent of revenues	Percent of GF
Sales and use tax	\$6,360,000	75%	0.05%
Corporate income tax	\$2,110,000	25%	0.02%
<b>Total</b>	<b>\$8,470,000</b>	<b>100%</b>	<b>0.06%</b>

Note: Individual amounts and percentages do not add up to the totals due to rounding. All dollar estimates are rounded to the nearest \$10,000.

In addition to direct taxes paid to the Commonwealth, the coal industry benefits the state budget through the payment of local taxes such as mineral property taxes and the coal severance tax, the revenues from which support the ability of coal-producing counties to pay a greater share of required funding for educational programming. This provides a contribution to the state budget by reducing demand on state funds for local education funding. In this manner, eligible local coal-related taxes benefited the state budget in FY2009 through an avoided expenditure amounting to an estimated \$6.6 million.

**Overall, the combination of direct coal industry tax contributions and the indirect benefits to the GF from local property taxes on minerals amounted to a total impact of \$15.1 million in FY2009, representing approximately 0.1% of GF revenues.** This small contribution to the state budget illustrates the coal industry’s minor role in the Commonwealth’s economy.

Estimating coal’s contribution to the GF from state sales and use and corporate income taxes begins with estimating the coal industry’s share of Virginia’s economic activity, as measured by relative non-government (private industry) gross domestic product (GDP).<sup>2,3</sup> The Bureau of Economic Analysis (BEA) does not provide GDP data for the Virginia coal industry, but it does report total “Mining” GDP for 2008 and 2009, which averages \$2.4 billion (BEA, 2010a). All mining activity, coal and non-coal, comprised an average of only 0.7% of the Commonwealth’s non-governmental GDP. “Mining” GDP includes the activity of the coal, natural gas, non-fuel minerals, and oil industries. To estimate coal industry GDP, we calculate coal’s average share of total gross production value of all mining industries in Virginia and apply that percentage to total mining GDP. We estimate that coal accounted for an average of 45% of all “Mining” activity in 2008 and 2009 (Table 2).

<sup>2</sup> Note that revenue from the state sales and use tax goes to both the GF and NGF. In this section, we only estimate coal’s contribution to the GF.

<sup>3</sup> We remove governmental income from total GDP because the state government does not pay taxes. This allows us to calculate coal’s share of taxable economic activity, and therefore make a refined calculation of the coal industry’s share of tax revenues.

**Table 2: Estimated production value by mining industry, average for 2008 and 2009**

Industry	Average production	Unit	Weighted average unit price	Average gross value (million \$)	Percent of total "mining"
Coal	22,943,500	short tons	\$81.08	\$1,860	45%
Natural gas	134,596,000	1,000 cubic feet	\$9.35	\$1,258	30%
Non-fuel minerals	various	various	various	\$1,022	25%
Oil	10,500	barrels	\$69.91	\$730	<1%
<b>Total</b>				<b>\$4,141</b>	<b>100%</b>

Source: Production and price for natural gas and oil from EIA (2010h-k); for coal from EIA (2010d and e). Total production value for non-fuel minerals from USGS (2010). Notes: Amounts rounded to the nearest million dollars; natural gas prices reflect the Virginia city gate price instead of the wellhead price. Wellhead prices would be more appropriate since they more closely reflect the raw price of the natural gas; however, wellhead prices for Virginia are not available.

As coal mining accounted for 45% of total "Mining"—which represented an average of 0.7% of the Commonwealth's total non-governmental GDP—we estimate that coal accounted for only 0.3% of all non-governmental GDP, on average, in 2008 and 2009 (Table 3).

**Table 3: Coal's average share of non-governmental GDP for 2008 and 2009**

	2008 (million \$)	2009 (million \$)	Average, 2008-2009 (million \$)
Total non-governmental GDP	\$326,915	\$332,017	\$329,466
"Mining" GDP	\$2,511	\$2,275	\$2,393
"Mining" as percent of total	0.8%	0.7%	0.7%
Coal as percent total Mining	46.0%	39.4%	44.9%
<b>Coal as percent total GDP</b>	<b>0.4%</b>	<b>0.3%</b>	<b>0.3%</b>
<b>Estimated coal industry GDP</b>	<b>\$1,155</b>	<b>\$896</b>	<b>\$1,075</b>

Source: Data for non-governmental and "Mining" GDP from BEA (2010a). Note: 2008-2009 averages are used to estimate FY2009 tax revenues from coal. Percentages are rounded to the nearest tenth of a percent.

Coal's share of non-governmental GDP is used to estimate corporate income tax revenues in Section 2.2, while data from Table 2 are used to estimate sales and use taxes remitted to the state GF by coal companies in FY2009.

## 2.1 Sales and use taxes remitted via coal mining dealers

All corporations and individuals making purchases in the Commonwealth pay the state sales and use tax. This tax, defined as "a license or privilege tax upon every person who engages in the business of selling at retail or distributing tangible personal property," applies to renters and users of services as well.<sup>4</sup> The state tax rate is 4% of the sales price, plus an additional 1% applied by all counties and localities; in total, the consumer pays a sales tax of 5% on goods and services in Virginia. Some items, including food and motor vehicle fuel, are taxed at a lower rate. In FY2009, revenue from the sales tax accounted for 21% of the Commonwealth's total GF revenue (VDT, 2010a). Because the Virginia Department of Taxation (VDT) does not track sales and use tax revenue by purchaser, it is impossible to know how much sales and use tax revenue was paid to the state via coal industry purchases. VDT does, however, track taxable sales by dealer, enabling us to estimate the amount of sales and use tax revenue remitted to the state via coal industry sales. In effect, our estimate of coal-related sales and use tax revenue reflects an indirect source of revenue attributable to coal.<sup>5</sup>

<sup>4</sup> Virginia Code § 58.1-603

<sup>5</sup> This fact represents a minor deviation from our previous methodologies. While other state departments of taxation may collect data by purchaser, VDT does not. Therefore, we are unable to calculate direct sales tax revenue. Instead, we estimated indirect sales tax revenue attributable to coal industry sales.

When reporting sales tax revenue, VDT reports taxable sales by North American Industry Classification System (NAICS) code. According to VDT's Taxable Sales Report, an average of 90 industrial dealers classified themselves as NAICS code 212—Mining (except oil and gas), which includes the coal and non-fuel mineral industries as listed in Table 2—and reported an average of \$379.1 million in taxable sales (VDT, 2008; 2009a).<sup>6</sup> Mining-related taxable sales represent the amount of sales by NAICS 212 industry dealers; for example, if a mine operator sells coal directly to a consumer, the consumer—unless he/she is an exempt entity—pays a sales tax of 5% of the purchase price to the coal company. The coal company then collects and remits the gross amount of sales tax to VDT. VDT then calculates and publishes the total amount of taxable sales per NAICS code as reflected by deposits of sales tax revenue during a given calendar year.<sup>7</sup>

In order to estimate the coal industry's share of NAICS code 212 taxable sales, we calculate the coal industry's average share of total gross production value for mining industries (except oil and gas) in Virginia in FY2009 and apply that percentage to total taxable sales for mining industries (except oil and gas).

Using only the data for coal and non-fuel minerals provided in Table 2, we estimate that the coal industry accounts for an average of 64.5% of mining “except oil and gas” activity in Virginia, as measured by proportional gross production value. We apply this percentage to total taxable sales for mining (except oil and gas)—which amounted to an average of \$379.1 million for FY2009—resulting in an estimate of taxable sales for the coal industry of approximately \$244.7 million. This sum is taxed at 5%, one percentage point of which goes directly to all counties, and four percentage points of which is distributed to counties and the GF. Ultimately, about 2.6 percentage points of the sales and use tax revenue goes to the GF for unrestricted use (Mayer, 2010).<sup>8</sup>

**Applying the effective tax rate of 2.6% to the estimated taxable sales reported for coal companies, we estimate that the coal industry remitted approximately \$6.4 million in sales and use taxes to Virginia's GF in FY2009.** An additional \$5.9 million was remitted to local governments through the distributions of state-level collections and the 1% county-level tax; given this report's focus on the state budget, these revenues are excluded from the present analysis. These contribution estimates are generous given the number of exemptions for which coal industry transactions qualify. Relevant exemptions include: commercial and industrial equipment, certified pollution control equipment, and goods purchased for resale (Stanwix, 2010). VDT does not collect data that reflect the value of these exemptions claimed by members of the coal industry; however, we provide estimates for these exemptions in Section 4.2.

## 2.2 Corporate income tax

According to the Virginia Division of Legislative Services (VDLS), corporations “organized under the laws of Virginia, and every foreign corporation registered with the Virginia State Corporation Commission (VSCC), for the privilege of doing business in Virginia or receiving income from Virginia sources,” must pay the corporate income tax, which is 6% of the corporation's taxable income (VDLS, 2010a, p. 49).<sup>9,10</sup> In FY2009, total revenue from the corporate income tax amounted to approximately \$648 million, or almost 5% of the Commonwealth's GF revenue. The corporate income tax is one of the most volatile sources of revenue for the Commonwealth, with collections decreasing 19.8% between FY2008 and FY2009 because of fluctuations in corporations' profits (DLS, 2010a).

---

<sup>6</sup> These values do not represent taxable sales reported for industries classified as “support activities for mining.” However, such activities represented less than 2% of taxable sales reported by VDT.

<sup>7</sup> VDT does not disaggregate sales and use tax revenues by industry type for NAICS codes beyond three digits.

<sup>8</sup> This percentage is only a rough estimate because certain funds are subtracted from the sales revenue and capped as specific dollar amounts instead of percentage points. For example, up to \$13 million from sales tax revenue goes to the Game Protection Fund, whereas 0.5 percentage points of the sales tax revenue goes to the Transportation Trust Fund (Mayer, 2010).

<sup>9</sup> Some corporations, including “S” corporations, are exempt from this tax. See Virginia Code § 58.1-402. Virginia taxable income is equal to federal taxable income with a few modifications. See Virginia Code § 58.1-402 and DLS (2010).

<sup>10</sup> Authorized by Virginia Code § 58.1-300 through § 58.1-549.



VDT does not report corporate income tax revenue by locality or industry classification. Therefore, we approximate the revenues attributable to coal by applying the industry's percent share of total non-governmental GDP to total corporate income tax revenues. As estimated previously, coal industry GDP amounted to approximately \$1.1 billion for FY2009, accounting for 0.3% of Virginia's non-governmental GDP of \$329.5 billion. As an industry's share of state non-governmental GDP can be used as a rough proxy for its share of net income, we use this value (0.3%) to represent coal's share of state net income for FY2009.

**Therefore, we assume that 0.3% of total corporate income tax revenue for FY2009 is attributable to the coal industry and estimate coal's contribution amounts to approximately \$2.1 million.** This is a generous estimate because of the number of exemptions that corporations may claim, ultimately reducing the amount of taxes paid.<sup>11</sup> See Section 4 for a discussion of these exemptions.

### 2.3 Local coal-related taxes and state funding for education

Local property taxes benefit the state budget by reducing the financial burden on the state for the funding of various programs, most notably education. According to the Joint Legislative Audit and Review Commission (JLARC), the state provides more aid to localities for education than for any other governmental purpose (JLARC, 2002). State payments for public education are largely driven by the state Standards of Quality (SOQ), which represents the state's "foundation" program for all school divisions. The Commonwealth's General Assembly is responsible for determining how state funds are distributed to local school divisions for developing and maintaining an education program that meets the SOQ. As part of this responsibility, the General Assembly must determine how the state and local governments share the cost for the SOQ.

Since FY1993, the State has implemented a policy of paying an average of 55% of the shared SOQ cost statewide (JLARC, 2002). The local share averages around 40% and the rest is covered by federal funds. However, the required local share is determined by a formula that calculates each locality's ability to pay, as measured by a composite index, which varies dramatically by locality. For example, the Arlington, Alexandria, and Falls Church school divisions had composite indexes of 0.8000, meaning these divisions were able to cover 80% of local SOQ costs. Conversely, the Lee, Wise, and Dickenson County school divisions had composite indexes of 0.1886, 0.2237, and 0.2358, respectively, meaning each division only had a sufficient revenue base for covering less than 25% of SOQ costs (JLARC, 2002).

Local governments use a variety of local revenue sources to fund services such as public education. The revenue source upon which localities are most reliant is property taxes (JLARC, 2002). In FY2009, property taxes accounted for an average of 31% of local revenues in the six coal-producing counties: Buchanan, Dickenson, Lee, Russell, Tazewell, and Wise (VAPA, 2011a). Real property taxes on minerals accounted for a fair portion of the revenues. In addition to property taxes, coal-related taxes such as the coal severance tax, Coal Road Improvement Tax, and Coalfield Economic Development Tax account for a substantial source of local revenue, amounting to an average of 25% of the local tax base in coal-producing counties. However, only coal severance tax revenues are available for funding education, with the remaining coal-related taxes dedicated to other purposes. In sum, of all local taxes on coal, only property taxes on minerals and the coal severance tax contribute local funding for education. These revenues benefit the state budget by reducing the amount of funding needed from the state for funding local education programs.

In FY2009, the state provided a total of \$171.2 million to Virginia's six coal-producing counties for SOQ costs (VAPA, 2011b). Using the composite indexes published by JLARC, we estimate that, in total, the six county governments contributed an estimated \$55.2 million, for an average composite index of 0.2437. Table 4 provides a breakdown of state, local and total SOQ funding by county for the six coal counties.

---

<sup>11</sup> This estimate is also generous given the number of limitations in this calculation. The estimated coal industry GDP used in order to estimate the industry's share of total non-governmental GDP, which in turn was used for this calculation, includes far more than profits. Likewise, many coal companies conduct business in more states than Virginia and would distribute the amount of corporate income tax among all states in which they conduct business (Knapp, 2010). The way we have completed this calculation, therefore, is a high estimate of what the coal industry annually pays.

**Table 4: Breakdown of state and local funding for education costs in coal-producing counties, 2009**

County	State SOQ (million \$)	Composite index	Local SOQ (million \$)	Total SOQ (million \$)
Buchanan	\$20.5	0.2572	\$7.1	\$27.7
Dickenson	\$16.4	0.2358	\$5.1	\$21.5
Lee	\$27.3	0.1885	\$6.3	\$33.7
Russell	\$26.0	0.2705	\$9.7	\$35.7
Tazewell	\$40.1	0.2753	\$15.2	\$55.3
Wise	\$40.8	0.2237	\$11.8	\$52.6
<b>Total</b>	<b>\$171.2</b>	<b>0.2437</b>	<b>\$55.2</b>	<b>\$226.4</b>

Sources: State SOQ funds for FY2009 from VAPA (2011b); local composite “ability to pay” indices from JLARC (2002). Notes: Total and local SOQ estimated using state SOQ fund data and composite index; totals may not equal sum of the data in each column due to rounding.

To estimate the impact that local coal-related revenues have on reducing the need for state education funding in the six coal-producing counties, we calculate the percent of total local revenues dedicated to SOQ costs for FY2009, and sum the coal-related revenues eligible for local education funding, which amounts to approximately \$29.8 million in FY2009. Finally, we assume that the same proportion of coal-related revenues are used for education funding as for all county revenues, and estimate each county’s share of total local SOQ costs that is funded from coal-related revenues. **This value represents our estimate for the benefit to the Virginia state budget resulting from taxes paid by coal companies to local governments, and amounts to an estimated \$6.6 million for FY2009 (See Table 5).** This is a conservative estimate given that reported revenues from mineral property taxes represent the combined revenues from coal, oil, and natural gas properties.

**Table 5: Estimate of local SOQ education programming costs contributed by coal-related revenues**

County	Total local revenue (million \$)	Local SOQ as percent of total revenue	Property tax on minerals (million \$)	Coal severance tax (million \$)	Total eligible coal revenues (million \$)	Coal share of local SOQ costs (million \$)
Buchanan	\$44.6	16%	\$1.4	\$9.9	\$11.3	\$1.8
Dickenson	\$25.0	20%	\$1.2	\$5.7	\$6.9	\$1.4
Lee	\$15.9	40%	\$0.1	\$0.1	\$0.2	\$0.1
Russell	\$28.7	34%	\$0.3	\$2.0	\$2.3	\$0.8
Tazewell	\$44.6	34%	\$0.3	\$1.1	\$1.4	\$0.5
Wise	\$44.6	26%	\$0.7	\$7.0	\$7.7	\$2.0
<b>Total</b>	<b>\$203.4</b>	<b>27%</b>	<b>\$4.0</b>	<b>\$25.9</b>	<b>\$29.8</b>	<b>\$6.6</b>

Sources: Total local revenue and coal severance tax revenue data from VAPA (2011a); data for mineral property tax revenues from Slone (2011), Edwards (2011), Cope (2011), Ferguson (2011), Hagy (2011), and Mullins (2011). Notes: Mineral property tax revenues represent combined revenues from coal, oil, and natural gas mineral properties, which could not be disaggregated; totals may not equal sum of the data in each column due to rounding.

## 2.4 Summary

In sum, the coal industry contributed an estimated \$8.5 million in direct tax revenues to the GF in FY2009, while saving the Commonwealth an additional \$6.6 million as a result of local property tax contributions. **Therefore, the total benefit to the state budget stemming directly from coal-related taxes amounted to approximately \$15.1 million in FY2009.**

While only a minor component of total GF revenue, contributions from coal do support a variety of the Commonwealth’s fiscal priorities. However, as an industry that has a significant impact on human health, the environment, and infrastructure—coal also imposes costs on the state budget. In other words, as a result of the existence of the coal industry, the state spends money to both support and regulate the industry, as well as to repair roads and bridges damaged by heavy coal trucks. These expenditures can be understood as “on budget” expenditures financed through the GF and TF, and are assessed in the following section.

### 3. DIRECT COAL INDUSTRY: ON-BUDGET EXPENDITURES

The Virginia state budget includes numerous expenditures that exist only because of the state's coal industry. These expenditures include a wide range of activities related to environmental protection, clean-up, and restoration; oversight of mining activities; and coal haul road maintenance and repair.

Some on-budget coal-related expenditures are paid for using GF and TF revenues, while others are paid for using federal funds or revenues from the NGF. In this section, for reasons described in Section 1.2, we focus only on expenditures that are paid for with funds from the GF and TF.

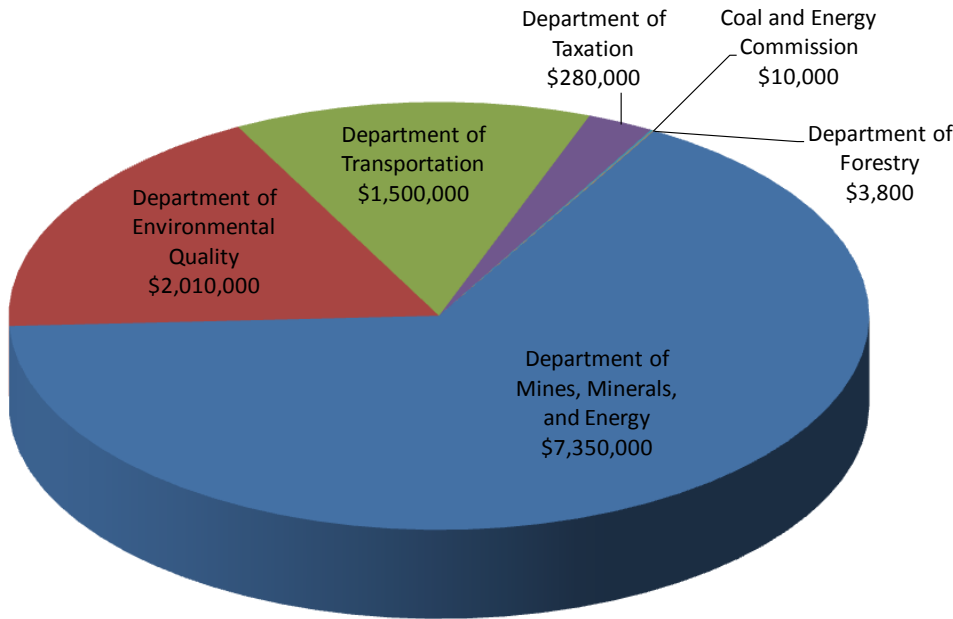
Because government agencies rarely collect information on industry-specific expenditures, a limited amount of coal-related expenditure data are available through the appropriate state agencies. Where official expenditure data are unavailable, we estimate coal-related expenditures using other available data and information. While this method is rough for several agencies, it is a valuable first step toward including not just revenues, but also expenditures in estimating the fiscal impact of the coal industry in the Commonwealth. Our estimates can—and should—be refined in future analyses.

In some cases, entire divisions of state government exist only because the coal industry exists; in these cases, on-budget expenditures can be calculated relatively easily. For example, the Division of Mined Land Reclamation (DMLR) within the Virginia Department of Mines, Minerals, and Energy (VDMME) is entirely focused on the coal industry. In other cases, however, an agency or division might spend only part of its funds on the coal industry. Unfortunately, agency expenditure data are not organized in such a way as to make it easy to separate out the coal-related portion. Likewise, departmental accounts do not usually provide industry-specific expenditures.

Our estimates are based on actual FY2009 expenditure data whenever possible; these data are supplemented with information from agency annual reports, official websites, and personal communications with agency personnel. Where this data-gathering process did not reveal explicit GF or TF coal-related expenditures, we estimate the percentage of each division's GF or TF expenditures that are attributable to coal and apply that percentage to programmatic expenditures to produce a FY2009 coal-related expenditure. The state expenditure for replacing, repairing, and maintaining roads and bridges damaged by the operation of overweight coal trucks is estimated using an entirely different method, described in Section 3.3.

**We estimate that on-budget expenditures for supporting or regulating the Virginia coal industry amounted to approximately \$11.2 million in FY2009.** As illustrated in Figure 7, the most significant on-budget expenditures originated in the VDMME and the Virginia Department of Environmental Quality (VDEQ).

**Figure 7: On-budget direct coal industry expenditures**



Source: Estimated in this report using various sources detailed in the following sections.

### 3.1 Department of Mines, Minerals, and Energy

The largest state agency expenditure in support of the coal industry is through VDMME. Its mission, “to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner,” reflects its strong focus on the mining industry (VDMME, 2010a). In FY2009, VDMME’s budget was \$33.8 million, 38% of which originated from the GF (Abbott, 2010a).

VDMME’s work is broken into six divisions, four of which are regulatory in nature, and two of which are not. The four regulatory divisions are DMLR, Division of Mines (DM), Division of Mineral Mining, and Division of Gas and Oil (DGO). These divisions are primarily concerned with administering federal and state laws. The two non-regulatory divisions include the Division of Energy and Division of Geology and Mineral Resources (DGMR); these two divisions are primarily concerned with research related to resource mapping, energy efficiency, and conservation. Only those divisions that directly regulate or in some way support the coal industry are considered in this section. Therefore, we exclude consideration of the Division of Mineral Mining and the Division of Energy.

#### 3.1.1 Division of Mines

DM is primarily interested in the health and safety of all mine workers: “The Division performs regular mine inspections, investigates accidents and fatalities, conducts training and certification of miners, and provides technical assistance to mine operators” (VDMME, 2010b). The Division operates several programs, including emergency response and mine rescue, enforcement, operators’ assistance, licensing, and accident reduction. DM’s total budgetary expenditure in FY2009 was \$4,633,538, of which \$4,116,963 originated from the GF. **Because VDMME estimates that 100% of DM’s annual expenditure is coal-related (Abbott, 2010b), we therefore report \$4,116,963 as a coal-related GF expenditure in FY2009.**

### 3.1.2 *Division of Mined Land Reclamation*

DMLR “is responsible for ensuring the reclamation of land affected by surface and underground coal mining activity” (VDMME, 2010c). To fulfill this responsibility, DMLR carries out many activities directly related to the coal industry; in fact, 100% of DMLR’s budget is coal-related (Abbott, 2010b). DMLR’s main activities include reviewing and issuing coal surface mine permits,<sup>12</sup> inspecting mine facilities, running the abandoned mine land (AML) unit (see Section 7), and assisting coal mine operators and engineers with compliance with permits and regulations. In FY2009, additional activities included: partnering with the US Army Corps of Engineers, Nature Conservancy, Natural Resources Conservation Service, local watershed groups, and US Environmental Protection Agency Region III and IV offices to develop watershed plans, aid in restorative efforts, and prioritize reclamation of mine lands; studying the effects of acid mine drainage; managing contracts and facilitating various partners in the reclamation of AMLs; conducting inspections on Virginia Pollutant Discharge Elimination System (VPDES) compliance and MSHA class impoundments; and involving the community in mine reclamation projects and various public presentations (OSMRE, 2009a).

Because of DMLR’s explicit focus on coal, most of its activities occur in coalfield counties: Buchanan, Dickenson, Lee, Russell, Scott, Tazewell, and Wise (DMLR, 2010c). DMLR is funded primarily by dollars that originate in the NGF, especially federal funds. Total expenditures in FY2009 amounted to approximately \$18 million; total expenditures from the GF amounted to \$2,145,406, representing 11% of its overall budget (Abbott, 2010a). **According to VDMME, 100% of DMLR’s annual budget is a coal-related expense (Abbott, 2010b); therefore, we report \$2,145,406 as a coal-related GF expenditure in FY2009.**

### 3.1.3 *Administration*

About 10% of VDMME’s total budget is dedicated to the administration of the six divisions considered in this section; because coal-related activities comprise 49% of VDMME’s GF expenditures (Abbott, 2010a), we apply 49% of administrative expenses funded through the GF—amounting to approximately \$2.0 million in FY2009—to coal-related tasks.<sup>13</sup> **Therefore, we estimate that VDMME administration resulted in a GF expenditure of \$990,000 to support the Virginia coal industry in FY2009.**

### 3.1.4 *Division of Geology and Mineral Resources*

DGMR is responsible for Virginia’s geological survey and compiles geological and geophysical data and publishes maps, reports, and databases with its findings. The goal of making these data available is to “reduc[e] risk from geologic hazards and encourage sustainable development and wise use of mineral, land, water, and energy resources” (VDMME, 2010d). DGMR provides its findings to individuals and mining companies alike. DGMR’s total budgetary expenditure in FY2009 was \$2,104,654, of which \$1,737,654 originated from the GF. VDMME estimates that 3.5% of DGMR’s activities are coal-related (Abbott, 2010b). **Therefore, applying the 3.5%, we estimate \$60,000 as coal-related GF expenditure in FY2009.**

### 3.1.5 *Division of Gas and Oil*

DGO is primarily concerned with permit issuance and inspections for gas and oil wells and pipelines, but also promotes reclamation and conservation practices associated with drilling. DGO’s main activities are not coal-related; however, the Division does regulate coal bed methane. According to the VDMME website, coal bed methane gas accounts “for over 79% of the natural gas produced in Virginia” (VDMME, 2010e). DGO’s total budgetary expenditure in FY2009 was \$1,134,408, of which \$816,408 originated from the GF. According to VDMME, 5% of DGO’s annual activities are coal-related (Abbott, 2010b). **Therefore, applying the 5% to DGO’s total GF budget, we estimate \$40,000 as coal-related GF expenditure in FY2009.**

---

<sup>12</sup> For each mine, DMLR issues one permit that satisfies both the coal surface mining operation and VPDES requirements.

<sup>13</sup> The sum of our estimated coal-related expenditures for each individual agency amounts to 52% of VDMME’s expenditures from the GF, which is only slightly higher than the estimate of 49% provided by Abbott (2010a).

### 3.1.6 Summary

In sum, the six divisions and administration of VDMME resulted in approximately \$7.4 million of general revenue expenditure in FY2009 (Table 6).

**Table 6: Department of Mines, Minerals, and Energy coal-related General Fund expenditures**

Departmental division	Total General Fund expenditure	Percent of total coal-related	Estimated coal-related expenditure
Division of Mines	\$4,116,963	100%	\$4,116,963
Division of Mined Land Reclamation	\$2,145,406	100%	\$2,145,406
Division of Administration	\$2,016,097	49%	\$990,000
Division of Geology and Mineral Resources	\$1,737,654	4%	\$60,000
Division of Gas and Oil	\$816,408	5%	\$40,000
<b>Total</b>	<b>\$10,832,528</b>		<b>\$7,350,000</b>

Note: Total is rounded to the nearest \$10,000.

## 3.2 Department of Environmental Quality

The mission of VDEQ is to “protect and improve the environment for the well being of all Virginians” (VDEQ, 2010). In fulfilling this mission, VDEQ implements programming related to environmental regulatory obligations, environmental enhancement, community initiatives, and permitting. VDEQ covers a wide range of issues, most of which can be generally categorized into three types of protection: air, water, and land. VDEQ also provides general services including environmental, technical, and financial assistance, and administration and support. When reporting budgetary expenditures, the Virginia Auditor of Public Accounts categorizes VDEQ activities into the type of protection. Of VDEQ’s \$317,088,467 FY2009 expenditures, approximately 13%—or \$40,146,056—originated from the GF (VAPA, 2010a).

### 3.2.1 Air, water, and land protection

VDEQ’s Air Quality Division fulfills statutory obligations under the federal Clean Air Act and runs the State Air Pollution Control Board; some of these activities are coal-related. For example, the Air Quality Division assists the coal industry and others with compliance with the National Ambient Air Quality Standards and other emissions regulations. Fugitive dust from coal transport and processing is regulated through a coordinated effort between VDEQ’s State Air Pollution Control Board and VDMME. A memorandum of agreement between the two agencies articulates their respective responsibilities: While VDMME issues coal surface mining operation and VPDES permits, VDEQ issues State Air Pollution Control Board permits to those coal-mining operations that require them (VDMME and VDEQ, 2009). VDMME ensures that coal-mining operations take measures to control fugitive dust and agrees to notify VDEQ of any “offsite fugitive dust complaints” (VDMME and VDEQ, 2009, p. 3). In FY2009, VDEQ’s air protection program accounted for 7% of the Department’s total expenditures from the state’s GF, or \$2,954,416 (VAPA, 2010b).

VDEQ’s water protection efforts are varied; one of VDEQ’s main water initiatives is the development of total maximum daily loads (TMDLs), as authorized by the federal Clean Water Act. The TMDL program was “designed to determine the total amounts of pollutant from all sources that a particular stream segment can receive and still achieve water quality standards” (VDEQ, 2000, accompanying memorandum). Most of the responsibility for compliance verification, data gathering, and development of TMDLs resides within VDEQ, although both the Virginia Department of Conservation and Recreation and VDMME have signed memoranda of understanding with VDEQ regarding these responsibilities. The Virginia Department of Conservation and Recreation assumes responsibility for any TMDL related to nonpoint source pollution, with the exception of those attributable to mineral extraction: “The VDMME agreed to administer the mineral extraction component of the TMDL process and participate in the public participation process” (VDEQ, 2000, p. ES-4).

Similarly, while most VPDES permits originate in VDEQ, VPDES permits required for the discharge of pollutants related to mining activities are issued by VDMME. In FY2009, VDEQ’s water protection program totaled 47% of the Department’s total expenditures from the state’s GF, or \$18,689,061 (VAPA, 2010b).

VDEQ’s land protection efforts include a variety of programming related to waste remediation, coastal zone and wetland protection, and rural land use or agricultural issues. Some of these programs are related to coal; for example, post-mined lands qualify as brownfields under US Environmental Protection Agency guidelines, even though most mined land reclamation efforts are coordinated through VDMME’s DMLR. In FY2009, VDEQ’s land protection program totaled 9% of the Department’s total expenditures from the state’s GF, or \$3,494,857 (VAPA, 2010b).

A portion of VDEQ’s air, water, and land programming is related to coal. For example, these coal-related issues include dust, nonpoint source pollution, and brownfields. VDEQ does not publish information with regards to the amount of agency expenditures that are coal-related. Therefore, we conservatively estimate that 5% of total air, water, and land GF expenditures—totaling \$25.1 million in FY2009 (VAPA, 2010b)—are coal-related. **We estimate that approximately \$1.3 million in GF expenditures for the air, water, and land divisions within VDEQ are attributable to the coal industry.**

### 3.2.2 *Administrative and support services*

VDEQ’s state and regional programming requires administrative and support services. We apply the same 5% to estimate costs that are accrued as a result of administrative and support services for coal-related activities. In FY2009, VDEQ’s total GF expenditure for administrative and support services was \$11,228,536 (VAPA, 2010b). **Therefore, we estimate \$560,000 as a coal-related GF expenditure in FY2009.**

### 3.2.3 *Environmental, technical, and financial assistance*

To assist with the protection of air, water, and land, VDEQ administers a variety of environmental and technical financial assistance programs. For FY2009, this work totaled \$3,779,185 from the state’s GF (VAPA, 2010b). VDEQ coordinates with VDMME on the protection of air, water, and land, and the delivery of environmental and technical assistance on these issues. We attribute 5% of VDEQ’s annual expenditures on environmental, technical, and financial assistance to coal-related activities. **Therefore, we estimate \$190,000 as coal-related GF expenditures in FY2009.**

### 3.2.4 *Summary*

**In sum, VDEQ spends about \$2 million from the GF in support of coal-related activities within the Commonwealth (see Table 7).** These expenditures pay for a variety of programming related to the protection of air, water, and land; the delivery of environmental, technical, and financial assistance; and the use of administrative services and support for the implementation of its divisions and their programming. We estimate that—at a minimum—5% of all of these activities are coal-related.

**Table 7: Department of Environmental Quality coal-related General Fund expenditures**

Departmental service	Total General Fund expenditure	Percent total coal-related	Estimated coal-related expenditure
Air, water, and land protection	\$25,138,334	5%	\$1,260,000
Administrative and support services	\$11,228,536	5%	\$560,000
Environmental, technical, and financial assistance	\$3,779,185	5%	\$190,000
<b>Total</b>	<b>\$40,146,055</b>		<b>\$2,010,000</b>

### 3.3 Department of Transportation

According to the agency's website, the Virginia Department of Transportation (VDOT) is responsible for building, maintaining and operating the state's roads, bridges, and tunnels (VDOT, 2010a), and its mission is to "plan, deliver, operate and maintain a transportation system that is safe, enables easy movement of people and goods, enhances the economy and improves [Virginia's] quality of life" (VDOT, 2010b).

VDOT data show that FY2009 TF expenditures from state tax sources amounted to approximately \$2.34 billion (VDOT, 2009a). The non-federal portion of the TF is primarily comprised of the Transportation Trust Fund (TTF) (also described as the Construction Fund), the Priority Transportation Fund, and the Highway Maintenance and Operating Fund (HMOF). State-sourced revenues for the TF come from the motor fuels tax, vehicle sales and use tax, vehicle license tax, a distribution from the state sales and use tax, and other sources. Transportation funds are used for planning, construction, and maintenance of the state network of roads, as well as for environmental monitoring and evaluation, administrative support services, support to other state agencies, and financial assistance to localities (VDOT, 2009a).

The Commonwealth's road system spans approximately 69,000 miles. Of these, 48,000 miles, or 70%, are secondary rural roads (VDOT, 2009b). Many industries rely on these roads for transporting goods and materials that are extracted, manufactured, and sold within and outside of the state. Without a well-maintained road system, state and local economies would suffer. However, the transport of materials and goods often occurs in heavy trucks, which cause greater damage to roads and bridges than other vehicles.

The transport of coal is one such example. Based on an average of coal distribution for 2008 and 2009, we estimate that approximately 2.5 million tons of mined coal were transported by truck in Virginia in FY2009, accounting for 15% of all coal distributed. Most coal, however, was transported by rail, with an average of 13.8 million tons of coal being transported from the mine by rail, accounting for 82% of all coal distributed (EIA, 2010b; EIA, 2010l). The heavy reliance on rail for the transportation of coal in Virginia helps avoid truck damage to roads and bridges located within or near coal-producing counties. However, the coal trucks that do operate are heavy and have a disproportionate impact on road infrastructure.

Coal trucks operating on the standard weight permitting system often operate at a gross vehicle weight (GVW) of 80,000 pounds. Virginia also provides a permitting system for the transportation of loads at GVWs up to 110,000 pounds for a vehicle with six axles hauling coal or other allowed materials (Virginia Department of Motor Vehicles, 2010). The majority of permitted coal trucks have six axles and are permitted to operate at a GVW of 110,000 pounds. Most of the remaining trucks have four axles and are permitted for a GVW of 70,000 pounds (Holiday, 2011).

Trucks with GVWs of 110,000 pounds impose substantial strain on roadways. According to VDOT, incremental increases in GVW results in an exponential increase in pavement damage (VDOT, 2001), thereby requiring extra maintenance and more frequent and costly repair to roads. This strain results in the accelerated degradation of the roads and bridges over which the trucks travel. As noted by the West Virginia Division of Highways, which also must address damage to its state's road and bridges from heavy coal trucks, "It is known that costly rehabilitation and replacement (of roads and bridges) will be required much earlier than anticipated where heavier loads are imposed on a regular basis" (WVDOH, 2002, p. 2).

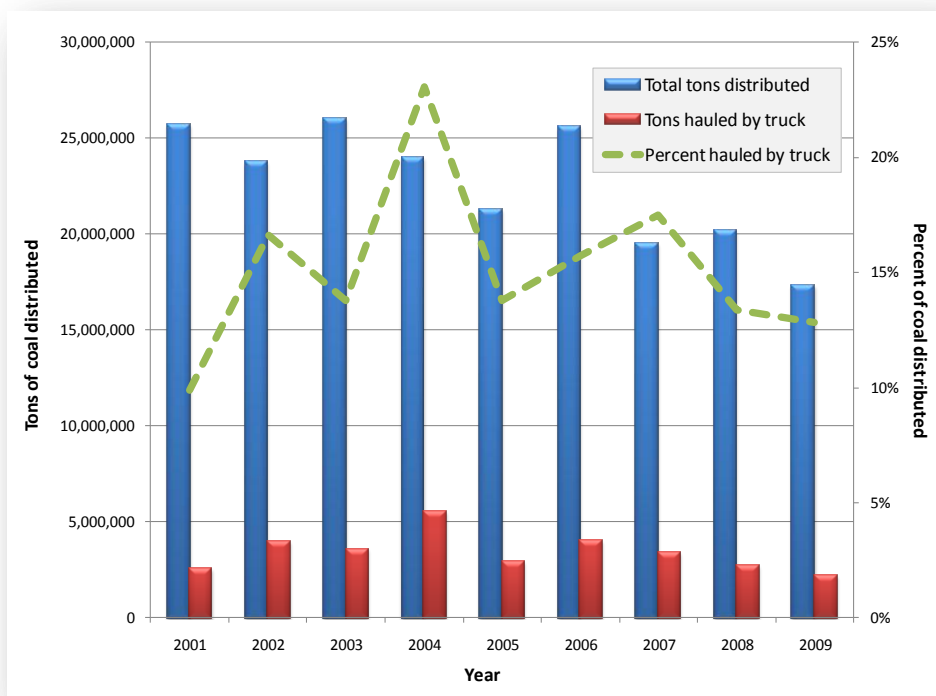
The strain on roadways—and, therefore, the cost and required frequency of repair—increases exponentially with weight (VDOT, 2001). The strain can be measured by looking at equivalent single-axle loadings (ESALs). One ESAL is defined as the damage caused to the pavement by the passing of one 18,000-pound single-axle vehicle (VDOT, 2001). ESALs are important because they allow comparisons of potential road damage from different types and weights of trucks.



At a GVW of 110,000 pounds, a typical six-axle coal truck produces between four and six ESALs on flexible pavement (Informa Economics, 2009),<sup>14</sup> and can generate approximately 10.5 ESALs on rigid pavement (Ohio Department of Transportation, 2009). In other words, the strain on roads resulting from a truck operating at a GVW of 110,000 pounds is, at a minimum, 400-600% greater than that from a single-axle 18,000-pound truck. The degree of road damage depends on various factors, which include pavement type and pavement condition: “The percentage increase in damage resulting from the additional weight would be drastically higher for structurally deficient pavements” (VDOT, 2001, p. 3).

Damage to roads and bridges from the operation of coal haul trucks is an issue of significance for coal-producing counties. In Virginia, the tons of coal distributed by truck, as well as the percent of total coal production transported by truck relative to other forms of transportation, has been generally declining since 2004, dropping from 5.5 million tons and 23% of total distribution, to approximately 2.2 million tons and 13% of distribution as of 2009 (EIA, 2010b; 2010i; 2010m) (see Figure 8). However, recognizing the impact that overweight coal trucks have on roadways in coal-producing counties, the Virginia Legislature enacted a Coal and Gas Road Improvement Tax in 1996. This tax, amounting to 1% of the gross revenues from the sale of gas or coal severed within the locality, is in addition to that which is collected via the severance tax. Three-quarters of the revenue is deposited in a fund dedicated to the improvement of coal and gas roads or the improvement of the water system within the county. The remaining quarter of the receipts goes to the Virginia Coalfield Economic Development Fund. The tax was set to expire in December 2010, but has since been extended until December 2014.<sup>15</sup> According to state code, the revenues generated by the tax do not replace general state transportation funds distributed to the counties.

**Figure 8: Total coal distributed and coal distributed by truck in Virginia, 2001-2009**



Source: EIA (2010b; 2010i; 2010m).

<sup>14</sup> Calculated by averaging the low end and high end ESAL range values for the 100,000 and 120,000 pound “six axle semi-trailer combination truck” categories.

<sup>15</sup> Virginia Code § 58.1-3713

In this section, we estimate the additional expenditures from the TF for FY2009 that were attributable to the transport of coal by truck in the state’s major coal-producing counties, which include Buchanan, Dickenson, Lee, Russell, Tazewell, and Wise counties.<sup>16</sup> To do so, we use state highway data to estimate the proportion of total daily vehicle miles traveled (DVMT) in each county that were traveled by coal truck. We then apply that proportion to each county’s receipt of state transportation funds to estimate coal-related state transportation expenditures for FY2009.

We start by calculating DVMT for trucks with four or six axles. These types of trucks may be considered as “coal type” trucks, meaning that coal trucks typically have either four or six axles (Holliday, 2011). We then estimate the percent of total DVMT by county traveled by “coal type” trucks—or, in other words, trucks that might be used for hauling coal at GVWs of up to 110,000 pounds—for FY2009 (represented by the average DVMT for 2008 and 2009) (VDOT, 2009c; 2010c) (see Table 8).

**Table 8: Estimating the percent of road use by “coal type” truck for coal-producing counties**

County	Total DVMT	DVMT by "coal type" truck	Percent "coal type" truck
Buchanan	680,581	4,125	0.6%
Dickenson	354,531	8,811	2.5%
Lee	573,068	2,695	0.5%
Russell	816,445	5,600	0.7%
Tazewell	963,296	3,704	0.4%
Wise	1,143,841	16,940	1.5%

Source: VDOT (2009c; 2010c).

To estimate the percent of total DVMT by “coal type” trucks attributable to coal, we first assume that all trucks of four or six axles operating in these six counties were hauling either coal or non-fuel minerals.<sup>17</sup> Then we apply EIA and VDMME data representing tons of coal and non-fuel minerals hauled by truck in 2008 and 2009 and estimate that coal transported by truck accounted for 36.6% of all coal and non-fuel mineral weight transported by truck in FY2009 (EIA, 2010b; EIA, 2010l; VDMME, 2010f).<sup>18</sup>

Multiplying the county percentages for total DVMT attributable to “coal type” trucks by the average DVMT for “coal type” trucks attributable to actual coal trucks (36.6%), we estimate the percent of total DVMT by coal trucks for each coal-producing county during FY2009 (see Table 9). To estimate coal-related TF expenditures for each county, we multiply the resulting percentages by each county’s total reported state-sourced TF expenditures for FY2009.

Finally, based on VDOT information (Holiday, 2011), we assume that all coal trucks operate at a GVW of 110,000 pounds, and that such trucks produce an ESAL of five—representing the average of the range of four to six ESALs for six-axle trucks. To account for the greater strain, and therefore greater damage to roads and bridges resulting from coal trucks, we multiply the previous step’s expenditure estimate by five to estimate the actual coal truck-related TF expenditure. Table 9 provides a summary of the complete calculation.

<sup>16</sup> State TF expenditures attributable to coal truck damage as estimated in this section supplement funds received on the county level through the Coal Road Improvement Tax, described in Appendix A.

<sup>17</sup> According to VDOT weight limits, permits for operating at GVW’s of up to 110,000 pounds with four or more axles may also be obtained for hauling sand, gravel, crushed stone, and liquids produced from oil or gas wells (Virginia Department of Motor Vehicles, 2010). Therefore, only producers of fuel and non-fuel minerals may operate trucks at a GVW of up to 110,000 pounds.

<sup>18</sup> This estimate of 36.6% is considered conservative given that we assume that all non-fuel minerals produced in Virginia’s coal-producing counties are transported by truck. The percentage would be higher if any of that production was transported by other modes such as rail.

**Table 9: Estimating coal-related state Transportation Fund expenditures by county**

	Total state expenditures	Percent DVMT by coal trucks	ESAL	Estimated coal truck-related expenditures
Buchanan	\$22,356,276	0.2%	5.0	\$250,000
Dickenson	\$11,550,159	0.9%	5.0	\$520,000
Lee	\$9,383,846	0.2%	5.0	\$80,000
Russell	\$9,795,750	0.3%	5.0	\$120,000
Tazewell	\$9,476,391	0.1%	5.0	\$70,000
Wise	\$17,118,942	0.5%	5.0	\$460,000
<b>Total</b>	<b>\$79,681,364</b>			<b>\$1,500,000</b>

Source: DVMT from VDOT (2009c; 2010c). State transportation expenditures by county from VDOT (2009d).

**Using the described method, we estimate that coal trucks in the Commonwealth of Virginia cost the state TF approximately \$1.5 million in FY2009.**

We consider this to be a conservative estimate given that the ESAL multiplier applies to flexible pavement rather than rigid pavement. Additionally, nearly 80% of the roads in the six coal-producing counties are classified as “secondary” roads (VDOT, 2007), and VDOT reports that as of 2009, 31.6% of secondary roads in the Bristol District—which contains the six coal-producing counties—were in either “very poor” or “poor” condition, with another 10.7% being in “fair” condition (VDOT, 2010d). This means that heavy coal trucks are likely causing even greater damage to coal haul roads—due to the likelihood of degraded road conditions—than is reflected in our estimate of coal truck-related damages.

### 3.4 Other agency expenditures

#### 3.4.1 Department of Taxation

VDT “collects taxes and deposits them with the state treasury, and administers the tax laws for individuals and corporations” (Virginia Secretary of Finance, 2010). As such, VDT administers various taxes related to the coal industry, as described in Section 2. In FY2009, VDT spent \$165,029,958, 52% of which—or \$86,408,404—originated from the GF (VAPA, 2010c). Because we estimate that 0.3% of the state’s total non-governmental GDP is attributable to coal mining, we apply this percentage to total VDT GF expenditures, **and estimate approximately \$280,000 as coal-related VDT GF expenditure in FY2009.**

#### 3.4.2 Coal and Energy Commission

The Virginia Coal and Energy Commission (VCEC) is one of 23 staffed committees, councils, and commissions within DLS. DLS “provides the members of the Virginia General Assembly with the highest quality legal and analytical information, support services, and advice” (DLS, 2010b). VCEC has 20 members, including five senators, eight congressman, and seven citizens. Its purpose is to “study all aspects of coal as an energy resource and endeavor to stimulate, encourage, promote, and assist in the development of renewable and alternative energy resources other than petroleum.”<sup>19</sup> VCEC receives all of its funding from the GF; in FY2009, this amounted to \$21,616 (Virginia Department of Planning and Budget, 2011). DLS estimates that about 50% of the VCEC’s activities are coal-related (DLS, 2010c). **Given that 50% of VCEC’s activities are coal-related, we estimate that VCEC resulted in an approximate GF expenditure supporting coal of \$10,000 in FY2009.**

<sup>19</sup> Virginia Code § 30-188

### 3.4.3 *Department of Forestry*

The Virginia Department of Forestry's (VDOF's) mission is to "protect and develop healthy, sustainable forest resources" (VDOF, 2010). Because most of Virginia's forested lands are privately held, VDOF is an important resource, providing educational support and technical assistance with forest health and protection, fire prevention, and urban forestry. In FY2009, VDOF's expenditures totaled approximately \$34 million, \$17 million of which was derived from the GF (VAPA, 2010d).

VDOF carries out few activities that are directly related to the coal industry; however, the state nurseries do provide tree seedlings to coal companies, landowners, and contractors for the purposes of reforestation and reclaiming previously mined areas. VDOF receives funding from OSMRE for the reforestation of AMLs and from the state for the reforestation of orphaned lands: "those areas disturbed by mining of all minerals, except coal" (VDMME, 2010g). VDOF activities that are directly relevant to coal mining are carried out in four of the six coal-producing counties: Buchanan, Dickenson, Lee, and Wise (DiFazio, 2010). The VDOF Fiscal Director estimates that state expenditures for supporting these activities are \$3,800 annually (DiFazio, 2010). Therefore, we estimate that VDOF spends \$3,800 annually on coal-related activities. **However, as this estimate cannot be rounded to \$10,000, we report the expenditure as \$0.**

## 3.5 *Academic institutions*

There are at least three publicly funded academic institutions in Virginia that have programming related to coal mining, safety, technology, or the reclamation of mined lands. Due to difficulties in obtaining annual budget documents from coal research centers, and in estimating GF expenditures on coal-specific programs, we do not estimate these expenditures. However, this section provides a brief description of each of the pertinent coal-related programs. It is important to note that the state does spend monies supporting these programs, and that without coal in the state, it is doubtful that this programming would exist; this is especially true for recertification programs that cater to the industry and for other programming related to miner safety and coal research.

### 3.5.1 *Virginia Polytechnic Institute and State University*

Virginia Polytechnic Institute and State University (Virginia Tech), a land grant institution founded in 1872 with the largest student population of any university in the Commonwealth of Virginia, has several coal-related programming venues, including: courses dedicated to reclamation, the Center for Coal and Energy Research, and the Center for Advanced Separation Technologies.

In addition, the Virginia Tech Department of Mining and Minerals Engineering is an academic department devoted to mining. Currently the department supports 170 undergraduate and 20 graduate students and several student organizations devoted to mining, including: the Burkhart Mining Society, Women in Mining, Mining Competition Team, and student chapters of the International Society of Explosive Engineers and National Stone, Sand, and Gravel Association. The Department is also home to the Virginia Center for Coal and Energy Research and the Center for Advanced Separation Technologies.

Additionally, professors within Virginia Tech's Forest Resources and Environmental Conservation Department focus primarily on mined-land reclamation efforts (Berger, 2010). One of their most prominent projects is the Powell River Project, "a cooperative program of [Virginia Tech], other educational institutions serving southwestern Virginia's coalfield counties, and southwestern Virginia's natural resource industries," that "conducts research and education programs to enhance restoration of mined lands and to benefit communities and businesses in southwestern Virginia's coalfield region" (Zipper, 1999). Research through the program "has developed effective, cost-efficient mine reclamation and environmental protection practices that are helping the Appalachian coal industry remain competitive while protecting the environment" (Zipper, 1999).

### 3.5.2 Mountain Empire Community College

Mountain Empire Community College (MECC) is a two-year college that primarily serves the counties of the Coalfield Economic Development Authority: Lee, Scott, Wise, and Dickenson Counties, and the City of Norton. MECC offers various academic and professional programs for students and the public, some of which are related to mines and mine safety. These include classes for those interested in becoming a miner, mine safety training programs for current miners, and a mining certificate. These programs served 1,866 miners in 2008-2009 (MECC, 2010a) and “more than 40 companies” (MECC, 2010b) and are primarily non-credit classes.

### 3.5.3 Southwest Virginia Community College

Southwest Virginia Community College (SWCC) is a two-year college dedicated to serving the populations of Buchanan, Dickenson (partial), Russell, and Tazewell Counties. SWCC offers a variety of academic programming, some of which is related to mining. In 2007-2008, SWCC recorded nine part-time students in the mining major within the Associate of Applied Science Engineering Technology degree program (SWCC, 2010a). Mine Health and Safety represented 25 students, or 6.4% of the career studies students, the fifth most popular program (SWCC, 2010b). The Workforce Development and Continuing Education division offers mining classes required by federal and state regulation, including electrician retraining and mine safety.

## 3.6 Summary

A wide variety of agency activities related to the coal industry is funded by GF expenditures. These include regulation of coal mines, environmental regulation and improvement of post-mined lands, education and research in support of the coal industry and coal-related workforce development, administrative services in support of these activities, and repair of road infrastructure damaged by coal trucks. **These activities resulted in an expenditure of approximately \$9.7 million from the GF and \$1.5 million from the TF in FY2009, for a total on-budget expenditure of \$11.2 million (Figure 7).**

Of the on-budget expenditures, those from VDMME are the most substantial, amounting to an estimated \$7.4 million in FY2009. This is because there are several units within the Department with significant coal-related expenditures required for overseeing and regulating the coal industry.

**Table 10: Estimated net direct impact of the coal industry on the state budget**

Item	General Fund	Transportation Fund	Total
Direct industry revenues	\$15,050,000	\$0	\$15,050,000
On-budget expenditures	(\$9,650,000)	(\$1,500,000)	(\$11,150,000)
<b>Estimated net impact</b>	<b>\$5,400,000</b>	<b>(\$1,500,000)</b>	<b>\$3,900,000</b>

**As shown in Table 10, the net impact of the direct coal industry on the Virginia state budget amounted to an estimated net benefit of \$3.9 million for FY2009.** This estimate considers only the direct revenues and on-budget expenditures attributable to coal. The estimated net impact is composed of a net benefit to the GF of \$5.4 million and a net cost to the TF of \$1.5 million.

These numbers are merely approximations; however, in considering the revenues generated by an industry, it is important to also consider the costs, as we have done in this section. These numbers can be refined in the future, and provide a starting point for comparing revenues with expenditures. Additionally, the on-budget expenditures are not the only expenditures from the state budget that go toward supporting the coal industry. **The state also loses a significant amount of potential revenue through the provision of certain tax credits and exemptions made available to the coal industry; these off-budget expenditures are discussed in the following section.**

## 4. DIRECT COAL INDUSTRY: OFF-BUDGET EXPENDITURES

We estimate off-budget expenditures from the Virginia state budget in the form of tax expenditures. As defined by VDT, tax expenditures “are provisions in the tax code, such as exclusions, exemptions, preferential tax rates, deductions, deferrals or credits that are designed to provide an economic incentive for a certain activity or provide financial assistance in the form of tax relief to taxpayers in certain situations” (VDT, 2009b, p. 3). VDT (2009b) equates tax expenditures to direct on-budget expenditures:

“The tax expenditure concept recognizes that the fiscal impact of a tax provision is similar to the outlay of a direct [on-budget] expenditure. One of the major differences between a tax expenditure and a direct expenditure is that the ‘cost’ is measured by reduced tax collections, instead of by the level of expenditure authorized through the normal legislative appropriation process” (p. 3).

In other words, VDT recognizes that tax expenditures represent a cost to the Commonwealth in the form of foregone revenue and are an equal cost to the state budget as traditional on-budget appropriations. Such expenditures reduce the funds available for other government programs and services, and, “just like [on-budget] appropriations...require either higher taxes elsewhere or reductions in spending in order to balance the state budget” (The Commonwealth Institute, 2009, p. 4). All tax expenditures provided through the Virginia tax code cost the state \$12.5 billion in Tax Year (TY) 2008, with expenditures aimed at specifically achieving public policy goals amounting to \$2.9 billion (JLARC, 2012).<sup>20</sup>

There are many reasons why tax exemptions, credits, and preferential tax rates are provided. These may include supporting small business, attracting new industries, incentivizing job creation, or supporting the public through suppressing costs for vital public services. The expenditure estimates reported in this section and in official VDT reports do not take into account the positive economic and revenue benefits of providing tax exemptions and credits. However, while economic benefits in terms of job creation or revenue generation may result, tax expenditures also reduce economic efficiency through the promotion and support of some economic activities over others, and “[b]ecause [tax expenditures] are the equivalent of a subsidy, it is vital to determine to which endeavors limited government resources should be allocated” (VDT, 2009b, p. iii). The Tax Foundation adds: “When tax expenditures are correctly viewed as spending, it becomes clear that states need to be accountable for how much they are spending through their tax codes...” (Robyn, 2009).

Prior to 2012, no state agency in Virginia had published a comprehensive tax expenditure report; therefore, policymakers were unable to ascertain whether tax expenditures resulted in a net benefit or cost for the state’s budget and taxpayers, or whether they were achieving their intended goals. As noted by JLARC, “because tax preferences are not subject to the State budgetary process, they often remain in effect, sometimes indefinitely, without any evaluation of their effectiveness,” and further, “little information is available about tax preferences, including which ones should be continued because they are effective, and which ones could be revised to improve their effectiveness or eliminated altogether” (JLARC, 2012, p. i).

The lack of information on tax expenditures is a serious problem for Virginia due to the potential for the expenditures to significantly reduce revenues while having little to no impact on economic activity. In relation to natural resource production, numerous studies analyzing the impact of tax rates on energy production have in fact found that tax rates have little impact on production, while significantly reducing state tax revenue (O’Leary, 2011). This is because taxes represent only a small part of the overall cost of doing business—particularly for extraction industries that experience lower-than-average tax liabilities (O’Leary, 2011). Additionally, as concluded by JLARC, external and uncontrollable factors, such as market forces, have a much greater effect on coal production and employment than do tax credits and tax rates (JLARC, 2012).

---

<sup>20</sup> The Tax Year (TY) is often different than the FY. The TY most often corresponds with the calendar year, which begins on January 1 and ends on December 31. However, the beginning and end dates depend on when tax returns are filed by a given entity. The FY corresponds with the state budget year, which for Virginia begins on July 1 and ends on June 30 of the following year.

In this report, tax expenditures related to the Virginia coal industry are assessed for the corporate income and sales and use taxes, the revenue from which are discussed in Section 2. We consider the following tax expenditures from corporate income tax revenue: the Coalfield Employment Enhancement Tax Credit and the Coal Employment and Production Incentive Tax Credit. The fiscal cost of allowed subtractions from federal taxable income is captured in the estimates for these two credits. From the sales and use tax, we consider exemptions for industrial machinery and equipment and pollution control equipment. As our report focuses on revenues and expenditures for the FY rather than the TY, we estimate coal-related tax expenditures from the sales and use and corporate income taxes for FY2009, using available data and information, including reported TY2008 and TY2009 credit values.

In total, we estimate that off-budget tax expenditures supporting the Virginia coal industry amounted to approximately \$37.4 million in FY2009 (Table 11). This represents foregone revenue for the GF. However, only \$14.2 million of this cost can be considered as directly impacting the state budget. The remainder can only be considered as foregone revenue, and is already reflected as such in the revenue values reported in Section 2. **Therefore, the direct cost to the state budget resulting from tax expenditures supporting coal amounted to \$14.2 million in FY2009 (see the Spotlight section on page 30).**

**Table 11: Off-budget expenditures supporting the Virginia coal industry**

Item	Estimate of coal-related expenditure	Percent of total
<u>Corporate income tax expenditures</u>		
Coalfield Employment Enhancement Tax Credit	\$22,160,000	59%
Coal Employment and Production Incentive Tax Credit	\$10,020,000	27%
<b>Total foregone corporate income tax revenue</b>	<b>\$32,180,000</b>	<b>86%</b>
<u>Sales and use tax expenditures</u>		
Exemption for industrial machinery and equipment	\$2,990,000	8%
Exemption for pollution control equipment	\$2,240,000	6%
<b>Total foregone sales and use tax revenue</b>	<b>\$5,230,000</b>	<b>14%</b>
<b>Total off-budget tax expenditure supporting coal</b>	<b>\$37,410,000</b>	<b>100%</b>
<b>Total expenditure directly impacting the state budget</b>	<b>\$14,200,000</b>	

#### 4.1 Expenditures from the corporate income tax

The two tax expenditures supporting the coal industry that reduce state corporate income tax revenues are the Coalfield Employment Enhancement Tax Credit and the Coal Employment and Production Incentive Tax Credit. JLARC reports a combined expenditure from the two credits of \$31.2 million for TY2008, but does not disaggregate the individual credit values (JLARC, 2012). Only the 2011 Corporate Tax Preference Report generates individual TY2009 expenditure estimates for the two credits: \$20.9 million for the Coalfield Employment Enhancement credit and \$0 for the Coal Employment and Production Incentive credit. By VDT's own admission, the reported value for the latter credit is incorrect due to the nature of the credit as described in Section 4.1.2 (Josephs, 2011).

This section estimates the value of each individual credit for FY2009. The estimates are validated by official agency reports. For instance, our FY2009 estimated value of \$22.2 million for the Coalfield Employment Enhancement Tax Credit approximates the TY2009 value of \$20.9 million reported by VDT (2011a). Additionally, our combined FY2009 estimated value for the two credits of \$32.2 million approximates JLARC's 2012 estimate of \$31.2 million for TY2008.

Finally, JLARC (2012) describes the purpose of the two credits as being to “slow the decline of Virginia coal employment and production by incentivizing both the production and consumption of Virginia coal” (p. 67). However, JLARC concludes that “an analysis of the change in coal production and employment over time indicates that the State’s coal tax credits may not have achieved their public policy goal,” and that despite possibly having promoted economic diversification in Virginia’s coal-producing region, “the coal tax credits may not be the most effective mechanism for accomplishing this goal” (p. 67).

#### 4.1.1 Coalfield Employment Enhancement Tax Credit

The Virginia tax code allows a Coalfield Employment Enhancement Tax Credit to be assessed against the corporate income tax. The credit provides a composite tax credit for coal mined in Virginia and coal bed methane gas produced in Virginia based on a per-ton or per-million British thermal unit rate and an employment factor.<sup>21</sup> Coal producers claiming the credit in a given year may only do so for the amount of coal produced three years prior. For example, a company claiming the credit for TY2009 can only do so for coal produced in calendar year 2006 and cannot claim the credit more than once for any ton of coal.

The reported value of the credit for TY2009—earned based on 29.6 million tons of coal produced in Virginia in 2006—was \$20,904,960 (VDT, 2011a). This amounts to an average credit of approximately 71 cents per ton. For this report, we estimate the value of the credit for FY2009 (instead of TY2009) by using the official formula and VDMME 2005 and 2006 data to calculate a projected credit value for TY2008 and TY2009. We then average the two values to estimate the FY2009 expenditure.

What follows is a description of each step in the process of calculating the Coalfield Employment Enhancement Tax Credit value. For each step we provide a table presenting VDMME data and our associated calculation (see Table 12 through Table 14). Table 14 provides the final estimated credit value for FY2009.

To begin, the credit applies to coal mined by both underground and surface methods. The base value of the credit depends on the mining type and thickness of the coal seam. For underground-mined coal, the value of the credit is \$2.00 per ton for seam thicknesses less than 36 inches and \$1.00 per ton for seam thicknesses greater than 36 inches. For surface-mined coal, the credit is \$0.40 per ton (see Table 12).<sup>22</sup> To estimate the base credit for FY2009 we calculate an average tonnage of coal produced in 2005 and 2006—by mine type and seam thickness—and multiply the resulting value for each category by its credit value.

**Table 12: Coalfield Employment Enhancement Tax Credit: estimating the FY2009 base credit value**

Mine type and seam thickness	Tons of coal produced, 2005	Tons of coal produced, 2006	Average tonnage claimed, 2005-2006	Per-ton credit value	FY2009 base credit value
Underground, < 36 inches	5,069,295	3,788,131	4,429,000	\$2.00	\$8,858,000
Underground, > 36 inches	10,497,368	13,916,663	12,207,000	\$1.00	\$12,207,000
Surface	11,370,911	11,824,607	11,598,000	\$0.40	\$4,639,000
<b>Total credit base</b>			<b>28,234,000</b>		<b>\$25,700,000</b>

Source: Coal production by year and mine type from McFaddin (2011). Note: We assume, in estimating the credit value for TY2008, that all coal for which the credit is being applied was produced in 2005, and that none of the remaining 25% of the credit for coal produced in 1999 was claimed on TY2008 returns. Values for average tonnage claimed are rounded to nearest 1,000 tons, and the FY2009 credit value is rounded to nearest \$10,000.

Once the base value of the credit has been calculated, that value is then adjusted using an employment factor, which is calculated as the ratio of the number of coal mining jobs, for the calendar year ending during the taxable year in which the credit is earned, to the number of coal mining jobs for the prior calendar year” (VDT, 2010b), and is calculated for each category of mining method and seam thickness.<sup>23</sup>

<sup>21</sup> Virginia Code § 58.1-439.2

<sup>22</sup> In that it provides a greater incentive for the mining of thin-seam coal, the credit functions as a thin seam tax credit, similar to that provided to coal companies operating in both Kentucky and West Virginia.

<sup>23</sup> The number of mining jobs must reflect a full-time equivalent as determined by dividing the total number of hours worked by all direct employees by 1,920 hours (the annual hours worked by a full-time employee).



To calculate the employment factor for our FY2009 tax credit estimate, we calculate an average “current year” full-time equivalent coal employment for any credit claimed in TY2008 and TY2009 (representing average employment for 2005 and 2006), and an average “prior year” employment (representing average employment for 2004 and 2005). Dividing the average “current year” by average “prior year” results in the employment factor, which we find to be 100% (see Table 13).<sup>24</sup>

**Table 13: Coalfield Employment Enhancement Tax Credit: estimating the FY2009 employment factor**

Variable	2005 (for TY2008)	2006 (for TY2009)	Average (for FY2009)
Total coal mining jobs, current year	4,932	5,091	5,011
Total coal mining jobs, prior year	4,706	4,932	4,819
<b>Employment factor (cannot be greater than 100%)</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Total employment hours for 2005 and 2006 from VDMME (2011). Note: Each of the employment values reflects full-time equivalent employment and was calculated by dividing total employment hours by 1,920. Additionally, all categories resulted in a 100% employment factor except for surface mining from 2005-2006, which resulted in a factor of 97% for the TY2009 estimate. However, the impact of the lower factor on the value of the total credit for TY2009 was insignificant, representing a difference of 0.5%. For the purpose of simplifying the table, we report the employment factor to be 100%.

To calculate the final coal mining–related value of the credit, we multiply the base value by the employment factor. We would then add the coal bed methane producer credit and the credit amount distributed to the coal producer from eligible pass-through entities, but these two values are either zero or negligible.<sup>25</sup> Therefore, we report the value of the Coalfield Employment Enhancement Tax Credit as the value generated strictly from the mining of coal. However, estimating the actual cost to the state that can be directly attributed to supporting the coal industry requires an additional adjustment.

The Virginia tax code states that any credit that exceeds a coal company’s tax liability will be redeemable at 85% of the credit value, with the remaining 15% being deposited into a regional economic development fund administered by the Virginia Coalfields Economic Development Authority (VACEDA). VACEDA reports a tax credit receipt of approximately \$2.7 million for 2008 and \$4.4 million for 2009, for an average receipt of \$3.5 million (VACEDA, 2102). Since this money is not received by the coal industry, it must be subtracted from the initial credit value in order to generate a net credit value reflecting the cost to the Virginia state budget of supporting the coal industry in FY2009.

**Table 14: Estimated value of the Coalfield Employment Enhancement Tax Credit for FY2009**

Item	FY2009 estimated value
Coal credit base	\$25,700,000
Employment factor	100%
<b>Initial credit value</b>	<b>\$25,700,000</b>
FY2009 distribution to VACEDA	\$3,550,000
<b>Net credit value</b>	<b>\$22,160,000</b>

Note: Totals are rounded to the nearest \$10,000. It is also notable that back-calculating the value of the tax credit using the reported tax credit distributions to VACEDA results in an estimate tax credit value for FY2009 of \$23.7 million, which closely approximates the initial credit value estimate of \$25.7 million reported in this table.

**As shown in Table 14, we estimate that the Coalfield Employment Enhancement Tax Credit resulted in \$22.2 million in foregone revenues for the GF in FY2009.** The average per-ton cost to the Commonwealth for FY2009—after subtracting the distribution to VACEDA—is \$0.78, which approximates the per-ton cost of \$0.71 for TY2009 calculated using the VDT credit value and VDMME reported production tonnage.

<sup>24</sup> The value of the employment factor entered on the tax credit form (Form 306) cannot exceed 100%.

<sup>25</sup> The coal bed methane credit is an additional credit of \$0.01 per million British thermal units, roughly equivalent to one million cubic feet of coal bed methane produced in the Commonwealth. This credit is claimed as part of the overall tax credit (VDT, 2010b, p. 2). Average coal bed methane production in Virginia for 2008 and 2009 was 75,000 million British thermal units, for a tax credit value of \$750. For pass-through distributions, due to a lack of data, we assume that the estimated credit value already accounts for any pass-through credit distributions from eligible entities.

#### 4.1.2 Coal Employment and Production Incentive Tax Credit

Virginia Code also allows for a Coal Employment and Production Incentive Tax Credit, which is a credit against any tax imposed by the state of \$3.00 for every ton of coal mined in Virginia that is purchased and consumed by a Virginia-based electricity generator for taxable years beginning on and after January 1, 2001.<sup>26,27</sup> For TY2009, VDT reports the value of the credit taken against the corporate income tax as \$0 (VDT, 2011a). No other tax preference report for any other applicable tax provides a specific estimate of the value of this credit. However, JLARC (2012) does estimate a combined credit value for the Coal Employment and Production Incentive and Coalfield Employment Enhancement tax credits of \$31.2 million for TY2008—which far exceeds the value of the Coalfield Employment Enhancement credit alone. Given this, and the nature of how the Employment and Production Incentive credit is allocated and redeemed, the actual value of the credit is likely to be greater than \$0.

The Code states that “in no event shall the credit allowed...exceed the total amount of tax liability of [the] taxpayer” but that “any tax credit not usable for the taxable year may be carried over to the extent usable for the next ten succeeding taxable years.”<sup>28</sup> In other words, if the value of the credit exceeds the tax liability of the utility earning the credit, the utility can carry the credit over for a period of ten years or until they are able to redeem the full value of the credit. Alternatively, the Code allows the credit to be sold, or allocated, back to the entity selling the coal to the utility, with the value of the allocated credit being negotiated in the contract between the two parties for the sale of the coal. In other words, if the utility is unable to redeem the credit, it can sell the credit to the coal company from which it is purchasing the eligible coal.

Given available information, the allowance to carry credits over, and the lack of state reporting on the true annual value of the credit, it is difficult to estimate the precise value of the redeemed credit for any given year. However, given that the credit is most likely redeemed—whether by the utility or the coal company, immediately or over a number of years—we assume that the estimated value of the credit for FY2009 reflects the full cost of the credit for the Virginia state budget, and report that cost for FY2009. It is important to note that regardless of which entity redeems the credit, the credit supports the coal industry, either through subsidizing the sale of the coal to a Virginia utility—thereby supporting additional demand—or through a direct financial subsidy for the coal company as a result of the allocation process.

To estimate the FY2009 tax credit value, we use 2008 and 2009 EIA data for shipments of coal from Virginia mines to Virginia electrical utilities, multiply the reported tonnage by \$3.00, and average the results. **As shown in Table 15, using this method, we estimate the FY2009 value of the Coal Employment and Production Incentive Tax Credit to be \$10.0 million.**

**Table 15: Estimated value of the Coal Employment and Production Incentive Tax Credit**

	Eligible coal (tons)	\$3 per ton credit value
2008	3,880,000	\$11,640,000
2009	2,800,000	\$8,400,000
<b>Average</b>	<b>3,340,000</b>	<b>\$10,020,000</b>

Source: Data for shipments of Virginia coal to in-state electricity generators from EIA (2010n and o).

This estimate reflects a maximum credit value because the actual value of the redeemed credit depends on the number of tonnage credits redeemed by electric utilities and the negotiated price for each credit they allocate to coal companies. This information is not publicly available. However, it could be expected that since the maximum value of the redeemable credit is \$3.00 per ton, the total value redeemed by utilities and coal companies would amount to \$3.00 per ton. Therefore, our estimated tax credit value is likely accurate.

<sup>26</sup> Virginia Code § 58.1-433.1

<sup>27</sup> Prior to January 1, 2006, the credit could only be applied against the corporate income tax, which is why this credit is included in this subsection.

<sup>28</sup> Virginia Code § 58.1-433.1-A

## ***Spotlight on the Coalfield Employment Enhancement and Coal Employment and Production Incentive tax credits***

We estimate that the value of the Coal Employment Enhancement and Coal Employment and Production Incentive tax credits for FY2009 are \$22.2 million and \$10.0 million, respectively, for a total reduction in the coal industry's tax liability of \$32.2 million. This is a significant cost to the Commonwealth. JLARC (2012) has concluded that the cost is not warranted given that the two credits have not been effective in slowing the decline in coal production and employment in Virginia. What follows is a summary of JLARC's findings.

### **Finding I: Declines in Virginia coal mining activity appear unaffected by the tax credits.**

Coal production and employment have declined by 52% and 54%, respectively, since their historic highs in 1990. With or without the credits, the decline in production was predicted by analysts due to the fact that more than 67% of recoverable coal reserves had already been mined. While it is difficult to isolate the true impact of the credits on slowing the decline in production and employment, several factors suggest it is limited at best. For instance, coal production and employment have both declined at similar or faster rates than was predicted if the credits had not been available.

**Finding II: External and uncontrollable factors appear to drive production and employment, and tax credits are unlikely to meaningfully counteract these negative factors.** The external factors listed by JLARC are interconnected, and include the amount and thickness of remaining coal reserves, production and transportation costs, and market prices. Less than 33% of the state's coal reserves remain and tend to be located in remote locations and deep, thin seams, which increases production and transportation costs. These costs are higher in Virginia than in the neighboring states of Kentucky and West Virginia, rendering Virginia coal less competitive in the domestic steam coal market. Despite the price-reducing impact of the credit, market prices for coal remain higher in Virginia. As a result, in-state mines supplied only 25% of coal used to generate electricity in Virginia in 2008.

### **Finding III: The two coal tax credits reduced average coal company tax liability by 135% for TY2008.**

Individual and corporate tax returns claimed an average of \$473,000 in coal tax credits in TY2008, reducing the average filer's tax liability by 135%. The credits fully eliminated the tax liability of all but seven individual and three corporate taxpayers claiming the credit. Because the Coal Employment Enhancement credit can be refunded, individual and corporate income tax filers received refunds totaling \$14.2 million. *In other words, not only were state tax revenues reduced as a result of the tax credits, the state—and therefore its taxpayers—actually paid the coal industry \$14.2 million for TY2008.* Therefore, based on JLARC's finding, we report that tax expenditures supporting coal resulted in a direct cost to the state budget of \$14.2 million in FY2009.

**Finding IV: A portion of the refunded credits for economic diversification benefit the coalfield region, but unemployment remains high.** Any credit value from the Coal Employment Enhancement Tax Credit that exceeds a coal company's tax liability will be redeemable at 85% of the credit value, with the remaining 15% being deposited into a regional economic development fund administered by VACEDA. Since 2001, VACEDA has received approximately \$28 million from the refundable coal credits. The funds are intended to promote economic diversification, and employment in the region has diversified to some extent; however, the region's unemployment rate remains substantially higher than the state average. *While the funds may effectively promote economic diversification in the coalfield region, coal tax credits may not be the most efficient mechanism to fund this goal.*

### 4.1.3 *Corporate income tax subtractions*

The Corporate Tax Preference Report notes that corporations operating in the Commonwealth of Virginia claimed approximately \$150 billion in income tax subtractions on both their TY2008 and TY2009 Virginia income tax returns, meaning that aggregate taxable net income for all corporations was reduced through subtractions allowed by Virginia tax code from federal taxable income. The fiscal impact of these subtractions amounted to a reported \$98.8 million in foregone revenue for TY2008 and \$521.7 million for TY2009, for an average impact of \$310.3 million (VDT, 2010c; 2011a).

The estimated fiscal cost represents approximately 0.2% of the average subtracted income, which, as VDT notes, “is much less than the amount of subtractions claimed multiplied by the 6% [corporate income] tax rate for several reasons” (VDT, 2010c, p. 2), among which include the fact that the subtractions claimed are deducted from federal income rather than income earned within the Commonwealth.<sup>29</sup>

Coal’s share of the fiscal cost associated with subtractions from taxable income for Virginia in FY2009 is captured in the estimates for the Coalfield Employment Enhancement and Coal Employment and Production Incentive tax credits. **While there may be additional avenues through which the coal industry’s tax liability may be reduced, we do not report any additional tax expenditure on coal resulting from corporate income tax subtractions.**

## 4.2 Expenditures from the state sales and use taxes

### 4.2.1 *Direct use exemptions for supporting natural resource production*

The Virginia tax code allows sales and use tax exemptions for pollution control facilities and equipment<sup>30</sup> and industrial manufacturing and processing.<sup>31</sup> JLARC (2012) asserts that the industrial manufacturing and processing exemption, described in their report as the “Manufacturing Materials and Equipment Exemption,” is provided in order to avoid tax pyramiding. In other words, the exemption prevents “taxes being imposed on a good or service at more than one stage of the production process so that the tax is only imposed on the price of the good or service at the final stage” (p. 133). However, since only 13% of the coal mined in Virginia is actually converted to electricity by Virginia-based utilities, we conclude that the majority of the coal being mined and processed using the tax-exempt machinery and equipment is not being taxed at a later stage (e.g., electricity generation or consumption in Virginia), and therefore very little pyramiding could occur were the exemption not available for coal companies.

Additionally, both of the exemptions considered here are best regarded as “direct use” tax exemptions rather than “purchase for resale” tax exemptions (those provided to avoid tax pyramiding). This means that while they represent exemptions provided for business inputs, the machinery and equipment used in the mining and processing of coal or used for pollution control are not converted to a final product, and therefore are not re-sold in any form. As a result, were the purchase of these items to be taxed, there would be no risk of double taxation further up the supply chain. In effect, these tax exemptions merely serve as a way to suppress production costs for coal produced in Virginia.

---

<sup>29</sup> Federal taxable income may represent all of the income earned by a corporation from their operations throughout the world. Therefore, the claimed subtractions do not represent subtractions from income earned as a result of Virginia-based operations; that value would likely be much smaller given that many corporations are multistate or even international corporations. Another possible reason for the discrepancy may be that in any given year a corporation may not be profitable, and losses from previous years may be subtracted from current-year federal taxable income, which would result in a reduction to corporate net taxable income in Virginia.

<sup>30</sup> Virginia Code § 58.1-609.3(9)

<sup>31</sup> Virginia Code § 58.1-609.3(2)

In relation to business inputs, businesses in the Commonwealth of Virginia and across the nation pay sales taxes on many of their inputs, also known as business purchases. In 2009, the Tax Foundation examined 20 types of taxes on business purchases in each state that levied a sales tax and found that almost every state taxes some form of business-to-business transaction (Padgitt, 2009). Virginia applied a sales tax to five types of business-to-business transactions in 2009 (Viard, 2010).<sup>32</sup> Many states even apply the sales tax to manufacturing equipment purchased by businesses when the equipment or materials are “consumed” in the manufacturing process, rather than becoming an ingredient or component of an article that is resold (Viard, 2010). This would apply to machinery and equipment used in the coal mining process.

Unlike the coal industry, which does not pay a sales tax on certain purchases, many businesses in the Commonwealth must pay the full 4% sales tax on major inputs into their businesses that they then sell to customers, including purchases of office equipment or insecticides, even though they are likely major inputs for many businesses (Padgitt, 2009). In sum, unless the Commonwealth of Virginia enacts an across-the-board sales and use tax exemption for all direct use business purchases, then these purchases qualify as tax expenditures specifically aimed at supporting specific industries, including the coal industry.

The pollution control tax exemption is an exemption for certified pollution control equipment and facilities used for coal, oil, and gas production.<sup>33</sup> JLARC estimates the cost of this exemption for all applicable industries to be \$3,757,945 for TY2008 (JLARC, 2012).

To estimate the cost of the exemption associated with coal, we first use data presented in Table 2 to calculate coal’s average share of total production value generated by the coal and oil and gas industries during FY2009—because these are the only industries that can apply for the exemption—which comes out to be approximately 60%. We then apply that percentage to the total value of the credit as reported for TY2008 and assume that the FY2009 exemption cost does not differ substantially from the TY2008 value. **Using this methodology, we estimate the coal-related cost of the exemption for pollution control equipment amounted to approximately \$2.2 million in FY2009.**

The tax exemption for industrial manufacturing and processing applies to the purchase of machinery, tools and equipment, or repair parts primarily used in processing, manufacturing, refining, mining, or converting products for resale. Therefore, coal companies are exempt from paying sales and use taxes on machinery and equipment used in the mining and processing of coal. The estimated value of this exemption for all applicable industries in TY2008 was \$916,876,850 (JLARC, 2012).

To estimate the value of the exemption provided to the Virginia coal industry, we apply our estimate for coal’s share of total private industry GDP in Virginia for FY2009 (0.3%) to the total estimated cost of the exemption for TY2008 and assume that the FY2009 exemption cost does not differ substantially from the TY2008 value. **Using this methodology, we estimate that the coal-related cost of the industrial manufacturing and processing exemption amounted to approximately \$3.0 million in FY2009.**

**Overall, the cost to the Commonwealth (in the form of foregone revenues) for supporting coal production, processing, and pollution control through sales and use tax exemptions amounted to approximately \$5.2 million in FY2009 (see Table 16).**

**Table 16: Estimate of sales and use tax exemptions for coal production and pollution control**

Item	Total value	Percent coal	Estimated coal cost
Exemption for pollution control equipment	\$3,757,945	59.6%	\$2,240,000
Exemption for industrial machinery and equipment	\$916,876,850	0.3%	\$2,990,000
<b>Total</b>			<b>\$5,230,000</b>

Note: Percentages are rounded to the nearest tenth of a percent.

<sup>32</sup> Computations were conducted by Viard (2010), and were based on Padgitt (2009).

<sup>33</sup> The gas portion includes gas, natural gas, and coal bed methane.

### 4.3 Summary and analysis

While the coal industry provides benefits for the Virginia state budget and Commonwealth residents through the provision of jobs and tax revenue, the Commonwealth, in turn, supports the industry through the provision of tax credits and exemptions, resulting in foregone GF revenue. However, detailed, contemporary data that describe these state tax expenditures for the coal industry or any other industry operating in the Commonwealth, and that examine the effectiveness of each expenditure in achieving its intended purpose, had previously been unavailable until the publication of the JLARC report on Virginia's tax preferences in late 2012. However, this represents a one-time publication. What is needed is a comprehensive and annual review of tax expenditures, particularly those identified by JLARC as failing to achieve their intended public policy goals; otherwise, the revenue lost through the provision of ineffective tax credits and exemptions may hinder the Commonwealth's ability to fund vital programs and services, or, conversely, may shift the tax burden onto other sectors of the population and business community. For these reasons, it is important to consider off-budget expenditures and the resulting loss of potential revenues when analyzing the true cost of supporting the coal industry or any other industry.

For FY2009, we estimate that total off-budget tax expenditures in support of the coal industry amounted to approximately \$37.4 million (see Table 11). However, in estimating the industry's net impact on the state budget, we only count the portion of these expenditures that resulted from refunds of certain tax credits. These refunds occur when the value of the tax credit exceeds a coal company's tax liability. As such, they represent a direct cost to the GF. As reported by JLARC (2012), refunds of the Coalfield Employment Enhancement Tax Credit and Coal Employment and Production Incentive Tax Credit amounted to \$14.2 million in TY2008. **Therefore, we report that tax expenditures supporting coal had a direct impact on the state budget amounting to \$14.2 million in FY2009.**

Combining this value with on-budget expenditures supporting coal, we estimate that the total cost to the state for directly supporting the coal industry amounted to \$25.4 million in FY2009. By comparison, total direct and indirect revenues contributed by the Virginia coal industry amounted to \$15.1 million. Therefore, the overall impact of the coal industry on the state budget amounts to a net cost of \$10.3 million for FY2009.

As one purpose of tax expenditures is to support industries that provide positive economic benefits for the state, a net negative balance suggests that this particular intention of coal-related tax expenditures is not being fulfilled in terms of being supported by an equal or greater amount of direct industry revenues. This conclusion is supported by the fact that the two biggest tax credits provided to the coal industry resulted in the average tax liability of coal companies and owners being reduced to such an extent that the value of the tax credits redeemed exceeded the average tax liability. In addition to the lost tax revenues, the state actually paid coal companies and owners a total of \$14.2 million in refundable credits.

The value of the tax expenditures suggest that coal production has been a priority for the state. However, tax subsidies provided to an industry that imposes a net cost on the state require considerable attention, particularly if an individual subsidy fails to achieve its intended purpose. We recognize, however, that coal's fiscal impacts include benefits at the local level—which we describe in Appendix A—as well as direct and indirect employment and related tax revenues, which we estimate in the next two sections.

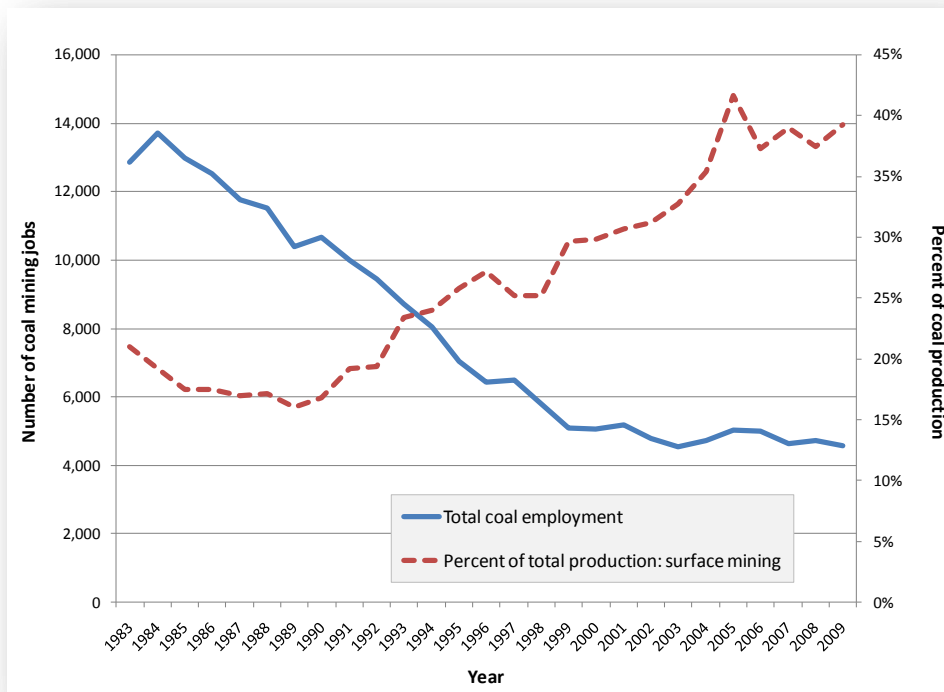
Despite these benefits, coal-related employment and local revenues have declined along with production, while at the same time the state has lost tens of millions of dollars a year as a result of tax subsidies supporting coal. The loss of revenues is more serious of an issue when considering that tax subsidies have little to no impact on natural resource production (JLARC, 2012; O'Leary, 2011). As such, the tax subsidies provided to the Virginia coal industry have resulted in a substantial cost to the state while failing to achieve their intended purpose of supporting coal production and employment. Given the declining value of the coal industry to state and local economies, state priorities and economic tax preferences should be re-examined.

## 5. DIRECT COAL EMPLOYMENT: REVENUES AND EXPENDITURES

Sections 2 through 4 estimate the direct revenues and expenditures for the coal industry itself. A balanced total accounting of coal's impact also includes revenues and expenditures related to coal employment. This section focuses on direct employment, and the following section focuses on indirect employment.

Direct employment in the coal industry includes those working directly in the mining, processing, and transportation of coal, as well as office workers, managers, and executive company officers. Direct employment in the Virginia coal industry amounted to 4,716 workers in 2008 and 4,582 workers in 2009 (see Figure 9).<sup>34</sup> While direct coal employment has remained relatively stable since 2002, current employment is significantly lower than it was in 1983. Coal mining employment is related to the total tons produced and the mining method. As shown in Figure 9, an increasing share of Virginia's coal is being produced from less labor-intensive surface mines.

**Figure 9: Direct coal employment and percent of total production from surface mining, 1983-2009**



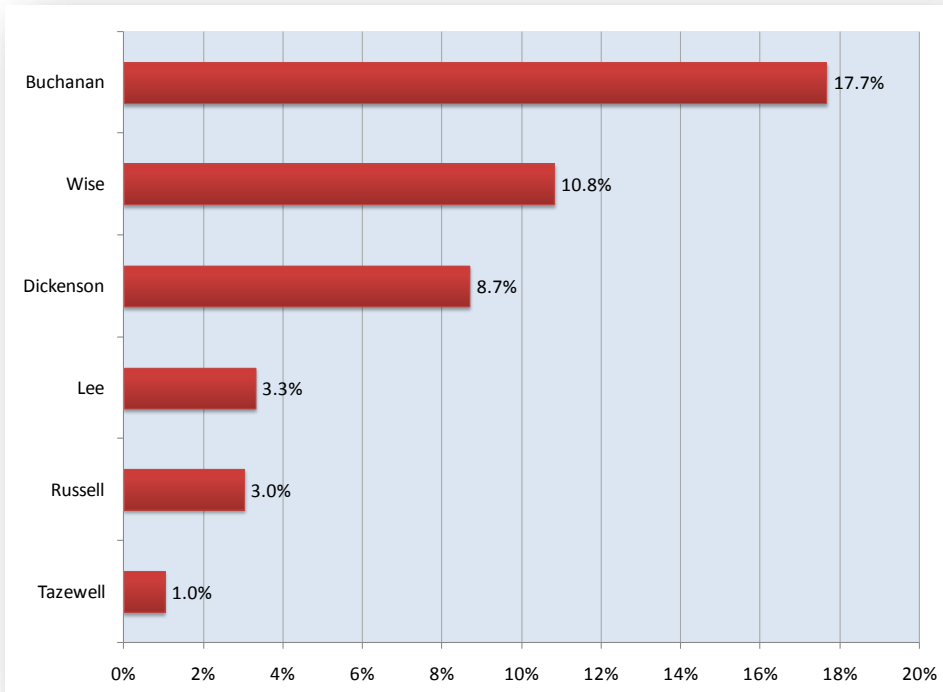
Source: MSHA (2010).

To estimate direct coal employment for FY2009, we average 2008 and 2009 employment data. This results in an average direct coal employment of 4,649 workers (MSHA, 2010). To calculate total employment across all sectors in Virginia for FY2009, we take a 12-month average of US Bureau of Labor Statistics (BLS) monthly total employment data for July 2008 through June 2009 (reflecting the months comprising FY2009), resulting in an average total employment of 3,707,367 (BLS, 2010a). **Therefore, direct employment in the coal industry accounted for approximately 0.1% of total employment in Virginia during FY2009.**

<sup>34</sup> There are various estimates for direct coal employment in Virginia. However, MSHA provides the highest employment values.

Jobs in the coal industry account for a greater portion of total employment in Virginia’s six coal-producing counties, however, averaging 6.6% of countywide employment. The coal employment rate is highest in Buchanan County, which relied on direct coal jobs for nearly 18% of countywide employment in 2008 (Figure 10). Buchanan County ranks second to Wise County in total coal production (MSHA, 2010; VWC, 2010).

**Figure 10: Direct coal employment as a share of total county employment for coal-producing counties**



Source: MSHA (2010) and Virginia Workforce Connection (VWC) (2010).

State data on the average wage for coal industry employees are unavailable. To calculate total coal wages earned by direct employees of the coal industry in Virginia for FY2009, we use an average wage of \$68,629. This represents the average wage for all coal miners nationally in 2008 and 2009 as identified by NAICS code 2121 and reported by BLS for 2008 (BLS, 2010b).<sup>35</sup> **Using this average wage, we estimate that the 4,649 direct employees of the Virginia coal industry earned approximately \$319 million in total wages in FY2009.**

The mean annual wage for all citizens working in the Commonwealth in 2008 and 2009 was \$47,740 (BLS, 2010c), suggesting that the average coal industry employee earns 40% more than the average worker statewide. However, the average coal industry wage—just like the average wage for all Virginians—is skewed by a small number of workers earning well above the average, including managers and high-level executives. From an economic policy perspective, it is important to understand that common representations of average miner wages fail to account for wage disparities among different categories of employment. Regardless, coal mining provides one of the highest-paid employment opportunities for workers in certain counties.

We use our estimates of 4,649 direct employees and \$319 million in total wages to estimate state tax revenues and expenditures associated with direct employment in the Virginia coal industry for FY2009.

<sup>35</sup> BLS wage data only reflect direct income earned as a result of labor, and exclude all other sources of income such as health benefits and interest earned in investments.



## 5.1 Revenues

Employees of the coal industry contribute tax revenues to the state GF and other funds. GF revenues are generated from the payment of the individual income tax, state sales and use taxes, and other lesser taxes such as the recordation and deeds of conveyance tax. Transportation-related tax revenues benefit the TF, and include the motor fuels tax, motor vehicle sales and use tax, road taxes, vehicle license fees, state sales tax distributions, and other miscellaneous taxes and fees (Virginia Department of Planning and Budget, 2011).

This section estimates the GF and TF tax revenues generated from direct employees of the Virginia coal industry. TF revenues are included because of the significance of state on-budget expenditures for repairing roads and bridges damaged by coal trucks, which are reported in Section 3.3.

Each direct coal job generates income for the employee, which then generates tax revenues that benefit the state budget. Precise data showing tax revenues paid by employees of the coal industry are not available, so for each tax, we used available data to generate our own estimates.

**We estimate a total of approximately \$23.1 million in direct employment-related revenues for coal industry employees in FY2009 (Table 17).** Of that, approximately \$20.2 million benefited the GF—representing 0.1% of total GF revenues, while the other \$2.9 million benefited the TF—representing 0.1% of total non-federal TF revenues.

**Table 17: Direct coal employment-related revenues**

Revenue	Amount	Percent of revenues
<u>To General Fund</u>		
Individual income tax	\$13,110,000	57%
Sales and use tax	\$6,380,000	28%
Other tax sources	\$700,000	3%
<b>Subtotal</b>	<b>\$20,190,000</b>	<b>87%</b>
<u>To Transportation Fund</u>		
Highway Maintenance and Operating Fund	\$2,000,000	9%
Transportation Trust Fund	\$940,000	4%
<b>Subtotal</b>	<b>\$2,940,000</b>	<b>13%</b>
<b>Total</b>	<b>\$23,130,000</b>	<b>100%</b>

Amounts are rounded to \$10,000 when estimated. The total is also rounded because it includes specific amounts that are rounded.

### 5.1.1 Individual income tax

Virginia state code authorizes an individual income tax on “taxable income,” the revenues from which are deposited into the GF. According to DLS, the starting point for determining taxable income is the federal adjusted gross income (AGI), which includes “wages and salaries, dividends, interest, unemployment compensation, capital gains and losses, rental income,” and other adjustments (DLS, 2010a). Virginia then adjusts the federal AGI to determine a Virginia AGI, calculated by allowing for certain subtractions from federal AGI and requiring certain additions. Virginia taxpayers can then claim certain deductions from the Virginia AGI, finally arriving at the taxable income, to which the income tax rate is applied to determine the amount of tax owed (DLS, 2010a).

Examples of allowed subtractions from the federal AGI include unemployment compensation, social security income, and disability income. Possible deductions from the Virginia AGI include a deduction for married persons, a smaller deduction for single persons, and deductions for each personal exemption claimed on a person’s federal income tax return. Because the Virginia AGI closely reflects an individual’s income before deductions are claimed, and because it is impossible to know the real amount deducted from the income of any employee in Virginia, coal-related or otherwise, we assume that the wages earned by direct coal employees—estimated at \$319 million for FY2009—are best represented as an AGI rather than a net taxable income. Therefore, to estimate the amount of revenue generated by individual income taxes paid by direct coal employees in FY2009, we apply the average rate of individual income tax paid by Virginia taxpayers on their AGI in TY2007, which was 4.1% (VDT, 2010a).<sup>36</sup> The average tax rate on Virginia AGI is not likely to have changed significantly since 2007, so we apply this rate to FY2009 wages earned by direct coal employees to estimate FY2009 individual income tax revenues.

As discussed above, the average wage of \$68,629 for a direct employee of the coal industry includes high-level management, and most direct coal industry employees actually make well below the mean. Therefore, to calculate individual income taxes paid by direct coal employees, we use the average effective tax rate for all Virginia taxpayers of 4.1% (VDT, 2010a).<sup>37</sup>

**Applying the effective tax rate on AGI of 4.1% to the total wages earned by direct employees of the coal industry, we estimate \$13.1 million in total individual income tax revenues for FY2009 (Table 18).** Total individual income tax collections in the Commonwealth of Virginia for FY2009 amounted to \$9.5 billion, so contributions from direct coal employment amounted to approximately 0.1% of the total.

**Table 18: Income tax revenues from direct coal employment, and percent of total state revenues**

Total direct income (wages)	Average effective tax rate on AGI	Estimated revenues from direct coal employees	Total Virginia individual income tax revenues	Percent of state total paid by direct coal employees
\$319,040,000	4.1%	\$13,110,000	\$9,481,109,000	0.1%

Notes: Amounts are rounded to \$10,000 when estimated; percentages are rounded to the nearest tenth of a percent.

<sup>36</sup> TY2007 represents the most recent year for which Virginia AGI and total tax liability data are available. In FY2009, total AGI in Virginia amounted to \$233.7 billion, while the total taxes collected on taxable income amounted to \$9.6 billion, for an average tax rate on AGI of 4.1%.

<sup>37</sup> Using the average tax rate may result in a higher-than-actual estimate for individual income tax revenues attributable to direct coal employees.

### 5.1.2 *State sales and use tax*

As discussed in Section 2, the Virginia state sales tax is a tax of 4% on the sales price of each item of tangible property sold at retail (DLS, 2010a). The state also imposes a corresponding use tax, which is imposed on all items of personal property used in the state that were bought from out-of-state retailers. In FY2009, state sales and use tax revenue amounted to \$2.9 billion, of which a total of two percentage points (50% of revenue) was distributed to counties and cities for expenses related to the operation of public schools, standards of quality, and the TTF (DLS, 2010a). The remaining two percentage points are usually expended at the discretion of the General Assembly.

Like all other Commonwealth residents, coal industry employees generate sales and use tax revenue when they spend their income. The effective sales tax rate—representing the percent of an individual’s income spent on sales and use taxes—is not equal to the full state tax rate of 4% because employees do not spend all of their income on consumption. Therefore, to estimate total sales and use taxes paid by direct coal employees in FY2009, we use the effective tax rate for “general sales-individuals”<sup>38</sup> for the \$36,000 to \$59,000 income range as reported by the Institute on Taxation and Economic Policy (ITEP). We choose this range based on the assumption that the annual wage for the majority of direct coal employees is likely to fall within the range. The combined effective rate for the selected income range, which reflects a range of average AGI for 2007,<sup>39</sup> is 2.0% (ITEP, 2009). **Applying this effective rate to total estimated wages—which we assume to be best represented as AGI—we estimate that consumer sales and use tax revenue attributable to direct coal industry employees amounted to approximately \$6.4 million in FY2009.** Total sales and use tax collections for FY2009 were \$2.9 billion, so contributions from direct coal employment amounted to approximately 0.2% of the total.

### 5.1.3 *Other General Fund tax revenues*

Other taxes, including the recordation and deeds of conveyance taxes and taxes on suits, wills, and administration, contribute to the GF and could be paid by direct coal employees and other Commonwealth residents. The tax on recordation and deeds of conveyance is imposed at a rate of 25 cents for every \$100 of deed or actual property value for every deed admitted to record (DLS, 2010a). The tax on wills and administration is a tax imposed on the probate of every will or grant of administration and the tax rate is based on the value of the estate and is set at a rate of ten cents for every \$100 of estate value for estates valued at over \$15,000 (VDT, 2010d). The total value of these two taxes for FY2009 amounts to \$304.3 million (VDT, 2010a).

Citizens also indirectly support the insurance premiums tax, which is a privilege tax administered by VSCC, and is assessed on the gross income from premium and subscription sales. The tax rate varies according to the type of insurance, and ranges from 0.75% to 2.25%. Revenue from this tax contributed \$255 million to the GF in FY2009.

Taxes excluded from consideration in this section are the corporate income tax,<sup>40</sup> the estate tax, the bank franchise tax, the watercraft sales and use tax, and taxes on railroad and car line companies. These are excluded because the taxes do not apply to coal industry employees—as with the corporate income tax, bank franchise tax, and taxes on railroad and car line companies—or because the total revenues were insignificant in relation to total collections—as with the watercraft sales and use tax. The estate tax does not apply because it exempts transfers of estate resulting from deaths after FY2008, and therefore did not impact FY2009 tax revenues.

---

<sup>38</sup> We only use the “general sales-individuals” tax rate so as to avoid double-counting taxes paid by coal employees on beer, cigarettes, and gasoline, which are classified by ITEP under the “other sales and excise-individuals.” For the luxury items—beer and cigarettes—these represent non-GF revenues and are not considered in this report. For gasoline-related revenues, these are represented as revenues from the motor fuels tax in Section 5.1.4.

<sup>39</sup> 2007 is the most recent year for which data are available for AGI and average tax rates from either ITEP or the VDT.

<sup>40</sup> Tax revenue from the coal industry via the corporate income tax is considered in Section 2.

Because effective tax rates are not available for all of the taxes considered here, we apply the percent of total state employment provided directly by the coal industry to the total state revenues from the two taxes considered in this section—the direct taxes on recordation and deeds of conveyance and wills and administration, and indirect insurance premiums taxes—for FY2009. We choose this method based on the assumption that all income earners spend, on average, the same amount for each of these taxes.<sup>41</sup>

The total revenue generated for the state GF by the taxes considered here amounted to \$559.3 million in FY2009 (Virginia Department of Planning and Budget, 2011), while direct coal industry employment accounted for approximately 0.1% of total employment. **Multiplying these values, we estimate that total “other” tax revenues attributable to direct coal industry employment amounted to \$700,000 in FY2009.**

#### 5.1.4 Transportation Fund revenues

In FY2009, VDOT was supported by approximately \$3.5 billion in federal aid and state revenues from transportation-related taxes, fees, and transfers from other sources. Generally, the VDOT budget is separated into the HMOF and TTF. Revenues from the Priority Transportation Fund—which was instituted in FY2008 and is largely funded by one-third of the revenues generated by the insurance premiums tax—contribute to the TTF.

Non-federal and non-local revenue sources for the HMOF include a portion of the motor fuels tax, motor vehicle sales and use tax, and motor vehicle license fees, as well as an international registration plan, miscellaneous revenues, and a transfer from the TTF. Non-federal, non-local revenue sources for the TTF include the remainder of the motor fuels tax, motor vehicle sales and use tax, and license fees, along with a road tax, aviation fuels tax, a transfer from the state sales and use tax, and a motor vehicle rental tax. As noted, the insurance premiums tax transfer supports the Priority Transportation Fund, accounting for approximately 85% of the fund. The total amount of transportation-related revenues that come from state funding sources, of which a portion could be attributable to direct coal employees, amounts to approximately \$2.3 billion in FY2009 (see Table 19).

**Table 19: Transportation taxes and fees paid by Virginia citizens, by source and fund**

Source	HMOF (million \$)	TTF (million \$)	Total (million \$)
Motor fuels tax	\$725.3	\$83.9	\$809.1
Vehicle sales and use tax	\$277.9	\$119.8	\$397.7
Vehicle license fees	\$218.5	\$16.3	\$234.8
State sales and use tax	n/a	\$404.9	\$404.9
Road tax	n/a	\$6.6	\$6.6
Aviation fuels tax	n/a	\$1.6	\$1.6
Motor vehicle rental tax	n/a	\$5.9	\$5.9
Miscellaneous revenues/revisions	\$9.1	(\$21.8)	(\$12.7)
Transfer from TTF to HMOF	\$362.6	n/a	\$362.6
Transfer from insurance premiums tax	n/a	\$132.3	\$132.3
<b>Total</b>	<b>\$1,593.4</b>	<b>\$749.5</b>	<b>\$2,342.9</b>

Source: VDOT (2009a and b).

Just as for individual income and sales and use taxes, employees of the coal industry pay taxes and fees related to transportation. The mining and transportation of coal generates revenues for the Virginia budget as well, beyond those generated by local collections. However, due to a lack of necessary data for generating separate estimates, we assume that transportation-related tax revenue generated by coal industry employees also captures the revenue generated by industry activity.

<sup>41</sup> By estimating tax revenues based on the ratio of coal employment to total employment, it is likely that we overestimate those revenues as well. An alternative method of estimating these revenues based on a ratio of coal employment to total working-age population—which would assume that transfer payments received by the unemployed also generate tax revenues—would have resulted in a smaller estimate for payments of these taxes by direct coal industry employees. Overall, it is likely that we have overestimated, rather than underestimated, the true contribution to the state budget from direct coal employment.

To calculate the coal industry and employment share of general vehicle and transportation taxes and fees, we follow the methodology used in MACED's report, *The Impact of Coal on the Kentucky State Budget* (Konty and Bailey, 2009). This methodology assumes that coal's total direct share of transportation revenues—both from industry activity and from taxes and fees paid by direct coal employees—is directly proportional to its share of total state employment.

**Applying the percent of total employment directly employed by the coal industry (0.1%) to total relevant transportation-related revenues, we estimate that total transportation revenues for the HMOF and TTF attributable to coal amounted to approximately \$2.9 million in FY2009.**

### 5.1.5 *Total revenues*

**Direct employment in the coal industry generated an estimated \$23.1 million in tax revenues for the Virginia state budget in FY2009 (Table 17).** This consisted of approximately \$20.2 million for the GF and a total of \$2.9 million in total for the TF.

Considering the lack of available data as well as some of the findings outlined in the sections above, this may either overestimate or underestimate these employees' true contribution to the state budget (see Footnotes 37 and 41, specifically). We recognize that our methodology for estimating tax revenue contributions does not produce precise estimates, but, given data constraints, we use the best methods available.

In any case, direct employment in the coal industry generates tax revenues for the GF and TF from various tax sources, including the individual income tax, sales and use tax, and others. These revenues are then spent on government administration, education, infrastructure, health care, and other services required to support industries and residents operating and living within the Commonwealth. Those employed in the coal industry receive their share of these expenditures, along with the provision of other goods and services. Therefore, the impact of coal on the state budget requires an accounting of the share of state expenditures attributable to supporting the coal industry's employees.

## 5.2 Expenditures

Estimating state expenditures for supporting direct coal industry employment first requires an estimate of total state expenditures from the GF and TF. We estimate total expenditures from these funds to be approximately \$16.0 billion for FY2009.<sup>42</sup> These funds were spent mostly on government administration, education, health and other services, economic development, and transportation and infrastructure. For the purpose of roughly estimating the portion of state expenditures necessary for supporting those directly employed by the coal industry, we adopt the methodology used by MACED (Konty and Bailey, 2009).

MACED’s method assumes that those expenditures are proportional to the direct coal employment share of total state employment. One possible criticism is that this method uses a per-employee factor instead of a per-capita factor and thereby overestimates state expenditures for supporting coal-related employment. This requires assuming that the only people receiving benefits from state expenditures are those who are employed, when in fact all citizens receive benefits from state expenditures. While we recognize that there is more than one possible method for calculating state expenditures for coal employees, we defer to the precedent for estimating expenditures based on a per-employee factor.

Our method uses the same approach that the 1980 study titled *The Fiscal Impact of the Kentucky Coal Industry* uses (Sims, 1980). This study was commissioned by the Kentucky Legislative Research Commission and conducted by respected economist Richard G. Sims. Sims’s underlying assumption is that a coal miner’s income supports more than just the miner, as the miner is most probably the primary income earner in the family. Calculating an employment-related expenditure based on a per-capita factor ignores this altogether. The Sims methodology, upon which the MACED calculation is based, produces an estimate that nearly equals our own, and serves as a precedent that we choose to follow in conducting our analysis.

As noted, direct coal employment accounted for approximately 0.1% of total state employment in FY2009. Following MACED’s methodology, we estimate direct coal-related employment expenditures by subtracting on-budget coal industry expenditures<sup>43</sup> from total GF and TF expenditures (of state-generated revenues) and multiplying the remainder by approximately 0.1%.

**This calculation results in a total estimated state expenditure in support of direct coal industry employees and their dependents of \$20.0 million in FY2009.**

**Table 20: Calculation of state expenditures supporting direct coal employment**

Item	Amount
Total expenditures of state revenues	\$15,973,490,000
Minus on-budget expenditures supporting coal	(\$11,150,000)
Net expenditures of state revenues	\$15,962,340,000
Percent total employment, direct coal employees	0.1%
<b>Estimated expenditures, direct coal employees</b>	<b>\$20,020,000</b>

Note: Reported employment percentage is rounded to the nearest tenth of a percent.

Applying the relative proportions of FY2009 state expenditures from the GF (85%) and TF (15%), we estimate that expenditures from the GF related to direct coal employment amounted to \$17.1 million, while those from the TF amounted to \$2.9 million (Table 21).

<sup>42</sup> Total expenditures from the GF in FY2009 were slightly less than revenues, equaling \$14.4 billion. However, we can only verify that \$13.6 billion of those expenditures are from revenue generated from state-sourced taxes and fees. Total expenditures of non-federal monies from the TF equaled revenues, which amounted to \$2.3 billion. We use a more conservative expenditure total of approximately \$16 billion, representing total expenditures from the GF and TF that were enabled by state-based revenues.

<sup>43</sup> The on-budget industry expenditures include those spent supporting the coal industry through administrative government activities as well as for repairing damage to the environment and state roads used for hauling coal. The road portion was adjusted based on relative shares of state and federal funding spent on the state-maintained roads in Virginia across which coal was hauled by truck.

### 5.3 Summary

Over 4,600 Virginia residents were directly employed in the coal industry during FY2009. These jobs support families and local economies in six counties. As shown above in Figure 9, employment in the coal industry declined sharply through 2003, but has since stabilized. At the same time, the average wage of direct coal employees rose, thereby increasing the revenues generated by that employment. However, absent a proportional increase in average mining wages, any future declines in employment will result in smaller employment-related revenues from coal. Conversely, coal industry employees require support and services from the Commonwealth that are paid for directly from the state budget, so any change in employment could affect a change in the amount the state spends to support the coal industry and its employees.

However, for FY2009, those directly employed in the coal industry supported the state budget through the payment of various tax revenues, most notably via the individual income tax and state sales and use tax. At the same time, those employees require state support in various forms. For FY2009, we estimate that the tax revenues generated by direct coal industry employees amounted to about \$23.1 million, while state expenditures to support those employees amounted to approximately \$20.0 million.

**In other words, the estimated impact on the Virginia state budget of direct employment in the coal industry amounted to a net benefit of approximately \$3.1 million.** This means that the expenditures from the state budget for supporting direct coal industry employees were less than the tax benefits resulting from that employment. As Table 21 shows, this was the case for the GF, while the net impact of direct coal employment on the TF amounts to \$0. This is because TF revenues from state sources are equal to expenditures, and in estimating both revenues and expenditures associated with direct coal employment we apply the same percent of total state employment to total revenues and expenditures. As a result, the calculations of revenues and expenditures produce equal results, as would be expected.

**Table 21: Estimated net impact of direct coal employment on the state budget**

Item	Transportation		Total
	General Fund	Fund	
Revenues from direct coal employment	\$20,190,000	\$2,940,000	\$23,130,000
Expenditures supporting direct coal employees	(\$17,080,000)	(\$2,940,000)	(\$20,020,000)
<b>Net impact of direct coal employment</b>	<b>\$3,110,000</b>	<b>\$0</b>	<b>\$3,110,000</b>

Coal industry activity also supports employment indirectly by requiring, for example, machinery and services to support the mining, processing, and transportation of coal. The next chapter estimates the revenues and expenditures attributable to indirect employment.

## 6. INDIRECT EMPLOYMENT SUPPORTED BY COAL: REVENUES AND EXPENDITURES

When discussing the total economic impact of any industry, it is necessary to include not only the direct impacts in terms of employment, tax revenues, and expenditures, but also the indirect and induced impacts of the industry. Like any industry, the coal industry relies on other industries and also generates economic activity and employment through this interdependence. This is the “indirect” impact of the coal industry. For example, in order to mine coal, companies must purchase machinery and supplies. These supply industries and their employees support the coal industry and are included in estimates of indirect employment impact.

“Induced” impacts are those generated and supported by spending in the economy. In the case of coal, coal employees earn income from their labor, and they spend that income on goods and services. Their spending creates and/or supports other industries and businesses. For example, coal miners earn income from mining coal, and they buy food and other items from a local grocery store. In this case, employment at the grocery store is supported by coal, to the extent that coal employees (and/or family members supported by their income) account for a certain percentage of the total spent by all customers.

For the purpose of simplifying the language used in this report, we follow MACED’s lead and combine indirect and induced impacts under the category of “indirect” impact (Konty and Bailey, 2009). Coal industry–derived indirect employment results in the generation of employment-related tax revenues, just as outlined for direct employment in the previous chapter. However, just as for direct employment, the jobs that are indirectly supported by coal require general government support and services from the state.

To calculate indirect impacts, we use the Regional Input-Output Modeling System (RIMS-II) economic impact multipliers for the coal industry in Virginia. Despite some potential pitfalls, multipliers such as those provided by RIMS-II are often used by the coal industry and by researchers to estimate the industry’s indirect impacts. We perform the calculations in this section with the recognition that, while imperfect, these multipliers allow us to clarify key issues and to establish initial estimates. A detailed explanation of RIMS-II and the use of economic multipliers is provided in Appendix B.

### 6.1 Revenues

As discussed, coal industry activity in Virginia creates and supports economic activity and employment in supply and support industries. These other industries may include companies from the construction, manufacturing, and distribution sectors that provide goods and services used for the production, processing, and transportation of coal. Each of these industries and their employees then pay taxes on their income, property, and purchases of goods, services, and gasoline. These revenues benefit the state budget by contributing to the GF and TF.

As shown in Table 22, using the RIMS-II multipliers, we estimate that the Virginia coal industry indirectly supported 12,428 employees in FY2009, representing approximately 0.3% of total state employment, including both full- and part-time employees. Total indirect wages amounted to \$454.2 million, for an average wage for indirect employees of \$36,550. By comparison, the average reported wage for direct employees of the coal industry is \$68,629, nearly twice the average wage earned by those in support industries and local businesses.



**Table 22: RIMS-II multipliers applied to employment and wages**

	Direct impact	RIMS-II impact multiplier	Total impact	Indirect impact
Employment	4,649	3.6734	17,077	12,428
Wages	\$319,040,000	2.4238	\$773,280,000	\$454,240,000

Indirect coal employment generates tax revenue for each of the same taxes considered in the previous chapter for direct employment. To calculate transportation-related taxes and fees and property taxes paid by indirect employees, we also use the same methodology as for direct employment.

For individual income taxes generated by indirect employment, we again use the average tax rate on AGI of 4.1%. **Based on this method, we estimate that individual income tax revenues generated by indirect coal-related employment amounted to approximately \$18.7 million in FY2009.**

**Table 23: Estimate of individual income tax revenues from indirect employment supported by coal**

Total indirect income (wages)	Average tax rate on AGI	Estimated revenues from indirect employees	Total individual income tax revenues	Percent of state total paid by indirect coal-related employees
<b>\$454,240,000</b>	4.1%	\$18,660,000	\$9,481,109,000	0.2%

Note: Percentages are rounded to the nearest tenth of a percent.

For the state sales and use tax contribution from indirect employment, we apply ITEP’s effective “general sales-individuals” tax rate of 2.3% for the \$19,000 to \$36,000 AGI range (ITEP, 2009) to the total income for indirect coal-related employees. This results in an estimated state sales and use tax revenue attributable to indirect coal-related employment of approximately \$10.5 million in FY 2009. Using the same methodology as for direct employment, we further estimate an indirect employment contribution for other taxes of approximately \$1.9 million.

Likewise, for contributions to the TF, we estimate an indirect employment contribution of about \$7.9 million for transportation-related taxes and fees.

**Therefore, we estimate that indirect employment attributable to coal industry activity generated a total of approximately \$38.8 million in tax revenues for FY2009.** This consisted of contributions of \$31.0 million to the GF and \$7.9 million to the TF (Table 24).

**Table 24: Indirect coal employment-related revenues**

Revenue	Amount	Percent of revenues
<u>To General Fund</u>		
Individual income tax	\$18,660,000	48%
State sales and use tax	\$10,450,000	27%
Other taxes	\$1,870,000	5%
<b>Subtotal</b>	<b>\$30,980,000</b>	<b>80%</b>
<u>To Transportation Fund</u>		
Highway Maintenance and Operating Fund	\$5,340,000	14%
Transportation Trust Fund	\$2,510,000	6%
<b>Subtotal</b>	<b>\$7,850,000</b>	<b>20%</b>
<b>Total</b>	<b>\$38,830,000</b>	<b>100%</b>

## 6.2 Expenditures

Indirect coal industry employment generates a significant amount of revenues that benefit the state budget; however, just as the state budget supports direct employees through the provision of funding for health, education, public safety, transportation and infrastructure, and other services, it supports indirect employees to the same degree.

To estimate the total state expenditures supporting indirect employment attributable to the coal industry, we apply the same method that we use to estimate expenditures for direct industry employees. Indirect employment attributable to coal accounts for approximately 0.3% of total state employment. After subtracting state expenditures for supporting the coal industry directly (on-budget items and repairs to coal haul roads), we multiply 0.3% by the remaining state expenditures from the GF and TF that were paid for with state-generated revenues.

**Based on this methodology, we estimate that the state expenditure on employees indirectly supported by the coal industry amounted to approximately \$53.5 million in FY2009.**

**Table 25: Calculation of state expenditures supporting indirect coal employment**

Item	Amount
Total expenditures of state revenues	\$15,973,490,000
Minus on-budget expenditures supporting coal	(\$11,150,000)
Net expenditures of state revenues	\$15,962,340,000
Percent total employment, indirect coal employees	0.3%
<b>Estimated expenditures, indirect coal employees</b>	<b>\$53,510,000</b>

Note: Employment percentage is rounded to the nearest tenth of a percent.

Applying the relative proportions of FY2009 state expenditures from the GF (85%) and TF (15%), we estimate that expenditures from the GF related to indirect coal-related employment amounted to \$45.7 million, while those from the TF amounted to \$7.8 million (Table 26).

## 6.3 Summary

**As summarized in Table 26, we estimate that employment indirectly supported by the Virginia coal industry resulted in a net cost to the Commonwealth of approximately \$14.7 million for FY2009.**

While direct employees generated a net benefit, indirect employees generated a net cost. This is due to the fact indirect employees make substantially lower wages than do direct coal employees. The employees of the support industries then pay fewer taxes and contribute less, per person, to state revenues than do direct employees. However, each of these indirect employees benefits from the same proportional share of state expenditures, regardless of their wages. Consequently, the revenues generated from indirect coal-related employment through the payment of taxes and fees fail to make up for state expenditures in support of those employees.

**Table 26: Net impact of indirect coal-related employment on the state budget**

Item	Transportation		Total
	General Fund	Fund	
Revenues from indirect coal-related employment	\$30,980,000	\$7,850,000	\$38,830,000
Expenditures supporting indirect coal employees	(\$45,660,000)	(\$7,850,000)	(\$53,510,000)
<b>Net impact of indirect coal-related employment</b>	<b>(\$14,680,000)</b>	<b>\$0</b>	<b>(\$14,680,000)</b>

Our conclusion is similar to MACED's in its analysis of the total impact of direct and indirect coal-related employment on the Kentucky state budget: that the benefits of that employment were outweighed by the cost to the state for supporting those employees (Konty and Bailey, 2009). **For the Commonwealth of Virginia, we estimate that the total direct and indirect coal-related employment impact amounted to a net cost of approximately \$11.6 million in FY2009.** In other words, when examining employment alone, coal-related employment costs the Commonwealth more than it contributes in revenues from taxes and fees.

The significance of the employment analysis is not in the calculation of the net impact; in fact, even though our estimates are the best available estimates given data constraints, they are merely estimates, and should only be regarded as such. The significance of the analysis lies in the fact that while direct and indirect employees benefit the state through the payment of various taxes, those employees in turn rely on state expenditures for services and support. Therefore, it is important to consider whether or not employment related to coal or any other industry results in a net benefit or a net cost to the Commonwealth.

As noted by MACED for Kentucky—and applicable for Virginia or any other coal-producing state—these findings overlook other costs of the coal industry to the Commonwealth of Virginia and its citizens. For example, the damage to land and streams in the areas where the coal is mined has lasting impacts on the environment, human health, and local and state economies. Because of their existing and potential impacts on the state and society for years to come, we consider coal legacy costs associated with AMLs and bond forfeiture sites (BFSs) in the following chapter.

## 7. LEGACY COSTS RELATED TO COAL

Coal industry activity has resulted in the accumulation of legacy costs for Virginia that are not calculated in our analysis of coal's impact on the state budget. This is because they represent costs that have built up over time, have yet to be paid for, or do not currently impact the budget directly. In this section we address only the legacy costs related to water contamination on AMLs and BFSs. However, additional costs associated with negative impacts on the health of miners and residents, property values, and natural resources also result from coal mining operations and associated activities and should be examined further by state agencies.

In Virginia, as in other Central Appalachian, Interior, and Western states, many coal mine operators have chosen to abandon their mines before full reclamation is complete, leaving a legacy of un-reclaimed land, polluted runoff, contaminated drinking water, and threatened health and safety. When this occurs, the mine operator deflects responsibility for the environmental clean-up to the state and federal government. Depending on when the mine was abandoned, the clean-up is paid for using different funding streams.

Some mines were abandoned before the 1977 Surface Mining Control and Reclamation Act (SMCRA), which requires that coal mines be reclaimed and cease to cause water pollution after a finite period of time (OSMRE, 2009b). These pre-SMCRA sites are called AMLs. Post-SMCRA sites are those abandoned since 1977 and are typically called BFSs. SMCRA requires operators to post bonds for reclamation; if operators abandon their mines, they forfeit their bonds to the state government, rather than spending the money required for reclamation. This distinction between AMLs and BFSs is important because distinct funding mechanisms are available to reclaim each type.

### 7.1 Abandoned mine lands

According to OSMRE (2009c), there are 2,894 AML problem areas identified in Virginia; these sites are scattered across 16 counties (see Table 27; Figure 11). Ninety-three percent of AML sites and 95% of the AML acreage lie within the six counties that produced coal in 2008. On average, 78% of the AML acreage has yet to be reclaimed. It should be noted that by definition no new AMLs are being created, but the list continues to grow as new sites are documented and surveyed. For instance, 1,020 acres of AMLs were added to the Virginia inventory in 2009 (Abbott, 2010b).

Approximately \$159.2 million has been spent to complete reclamation projects on these sites (Williams, 2011). However, it is estimated that an additional \$436.8 million worth of work is required to reclaim the remaining AML sites (Abbott, 2010b). This estimate is likely an underestimate because state agencies do not always address water quality discharges to the extent that surface water quality standards require. In addition, this database of AMLs may not be entirely complete. Still, this estimate provides an initial approximation of the scale of work that remains.

The Abandoned Mine Reclamation Fund, established via provisions in Title IV of SMCRA (OSMRE, 2009b), is the primary funding mechanism for reclaiming AMLs. This fund is generated by a federal tax on every ton of mined coal; the taxes are then allocated to state environmental agencies for reclamation projects. From 1977 through 2007, fees were set at 35 cents per ton for surface-mined coal and 15 cents per ton for underground-mined coal. Upon reauthorization in 2006, these fees were lowered. In FY2008-2012, fees will be 31.5 and 13.5 cents per ton, respectively. In FY2013-2021, the fees will decrease to 28 and 12 cents per ton.

**Table 27: Virginia abandoned mine lands by county**

County	Number of abandoned mine lands	Total acreage	Acres of completed reclamation	Un-reclaimed acreage	Percent unreclaimed
<u>Coal-producing counties</u>					
Buchanan	1,173	20,104	3,703	16,402	82%
Dickenson	387	10,524	2,392	8,133	77%
Lee	194	4,081	1,407	2,674	66%
Russell	210	3,543	927	2,616	74%
Tazewell	122	3,450	916	2,533	73%
Wise	603	34,720	7,194	27,526	79%
<b>Sub-total</b>	<b>2,689</b>	<b>76,422</b>	<b>16,539</b>	<b>59,883</b>	<b>78%</b>
<u>Other counties</u>					
Augusta	2	< 1	< 1	-	0%
Botetourt	1	< 1	-	< 1	100%
Chesterfield	54	110	4	106	97%
Goochland	13	36	< 1	36	99%
Hanover	2	< 1	-	< 1	100%
Henrico	16	42	1	41	97%
Montgomery	61	104	18	86	83%
Powhatan	14	30	10	19	65%
Pulaski	11	18	-	18	100%
Scott	31	25	2	23	92%
<b>Sub-total</b>	<b>205</b>	<b>365</b>	<b>36</b>	<b>329</b>	<b>90%</b>
<b>Total</b>	<b>2,894</b>	<b>76,787</b>	<b>16,574</b>	<b>60,213</b>	<b>78%</b>

Source: Number of AMLs from OSMRE (2009c); total and completed acres from Abbott (2010b).

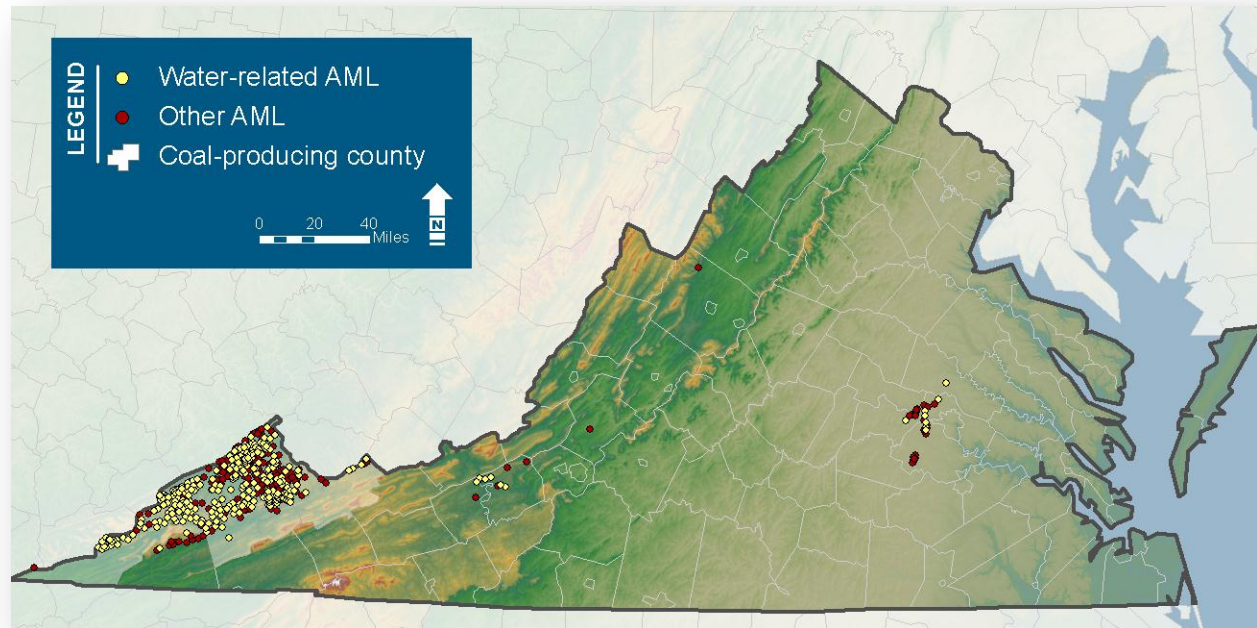
In Virginia, DMLR within VDMME administers the AML program (see Section 3.1.2). Until the 2006 reauthorization, the federal government was not fully appropriating these funds to the states. The unappropriated balance totaled \$2.2 billion at the end of FY2009 (OSMRE, 2009d). The collection of fees for funding AML program will cease after FY2022, regardless of whether the remaining balance of funds provides sufficient funding to address all remaining AMLs. However, the full remaining balance after FY2022 will be distributed to the states: “After the end of the fee collection period, mandatory distributions of money from the Fund for FY2023 and subsequent years will continue from balances in the Fund at the same level as FY2022 to the extent funds are available” (OSMRE, 2008, p. 1).

States receive distributions from the fund based on a variety of formulas, which were also modified during the 2006 reauthorization. These changes dramatically increased the amount of money sent back to states like those in Central Appalachia that have a continuing legacy of unreclaimed AMLs. In 2009, \$10.3 million was distributed to Virginia (OSMRE, 2009e), while in 2010, the distribution increased to \$13.2 million (Buckley, 2010).<sup>44</sup> Total distributions to Virginia through the end of the program cannot yet be precisely calculated. However, according to OSMRE’s estimate, Virginia would receive only \$124.6 million through the end of the collection period (Abbott, 2010b), less than one-third of the \$436.8 million worth of required work. **If this estimate is correct, and without new sources of federal revenue, state funds would be required to cover any remaining costs in the future, amounting to approximately \$312.2 million.**

<sup>44</sup> This amount includes funding for AML grants, the Clean Streams Initiative, and the Watershed Cooperative Agreement Program (Buckley, 2010).

Again, this is likely an underestimate since it likely will not be sufficient to meet water quality standards, the AML database may not be entirely complete, and the estimated funds to be distributed through 2022 is only a hypothetical estimate that assumes that coal production levels will be maintained. However, as Virginia coal production is likely to decline significantly through 2015, the state may not receive the full estimated level of funding.

**Figure 11: Abandoned mine lands in Virginia**



## 7.2 Bond forfeiture sites

BFSs are coal mines that have been abandoned since SMCRA required the posting of bonds in 1977. For these mines, operators have chosen to forfeit their bonds rather than continue to pay for reclamation. As of 2009, Virginia had reclaimed all but one of its 334 BFSs (Abbott, 2010b). No new sites were forfeited in 2009; however, a total of 66,216 acres remained under bond at the end of FY2009 (OSMRE, 2009e). BFSs are reclaimed using the bonds forfeited by mine operators. These funds are held in a state-managed account, the Bond Forfeiture Fund,<sup>45</sup> which currently contains the \$17,028.65 estimated to be necessary to reclaim the one outstanding BFS in the state (Abbott, 2010b). As with AMLs, the official estimated costs of remediating BFS may be low if the estimates are insufficient to ensure that surface water quality standards are met.

## 7.3 Summary

The coal industry's thousands of legacy AML sites in Virginia present a liability for the state. Because the main funding mechanism in place to reclaim these sites is insufficient and scheduled to end in 2022, action is needed to ensure that reclamation is completed, the costs of which are not shifted to taxpayers. If no action is taken, the Virginia state budget could face additional expenditures amounting to hundreds of millions of dollars to reclaim these legacy sites.

<sup>45</sup> This is a state-managed fund handled by the Virginia Department of Accounts.

## 8. CONCLUSIONS AND RECOMMENDATIONS

In the Commonwealth of Virginia, the coal industry provides jobs and generates revenues that benefit citizens and the state budget. These benefits are generated directly through coal industry activity, such as the mining, processing, and transportation of coal. The industry also indirectly benefits the state by supporting supply sectors and other businesses, which generate additional jobs and state revenues. The revenues in turn benefit the public through the funding of various services such as education, infrastructure improvements, health support, environmental protection, and government administration.

However, as detailed in this report, the revenues generated directly by the coal industry did not constitute a substantial portion of state tax revenues for either the GF or the TF in FY2009, and coal industry employment accounts for only a small portion of total state employment. There are various costs associated with the coal industry as well, and traditional accountings of the economic impact of the industry for other Central Appalachian states have not accounted for these costs. In this report, we provide a thorough and detailed accounting of the net impact of the coal industry on the Virginia budget by considering both the benefits and the associated costs of the industry, direct employment, and indirect employment.

### 8.1 Jobs

The Virginia coal industry directly provided 4,649 jobs and supported another 12,428 jobs indirectly in FY2009, representing a total of approximately 0.5% of total employment in the Commonwealth. This is a small portion of the state workforce. For some coal-producing counties, the impact was more significant: direct coal industry employees comprised 18% of total county employment in Buchanan County, 11% in Wise County, and 9% in Dickenson County. However, direct employment in the coal industry accounted for an average of only 2% of total employment for the remaining three counties producing coal in FY2009.

Total wages for direct coal industry employees amounted to an estimated \$319 million in FY2009, with an average wage of \$68,629. Those indirectly employed as a result of coal industry activity earned a total of \$454.2 million in FY2009, with an average wage of \$36,550.

### 8.2 State revenues and expenditures

The coal industry and its employees benefit the Virginia state budget through the payment of taxes and fees which are deposited into the GF and TF. Despite our efforts to obtain official data and estimates for each revenue and expenditure, the lack of data and information for various items requires that we generate estimates. Therefore, our results for revenues, expenditures, and net impact should be regarded as estimates, and not precise numbers. Despite these uncertainties, we regard these as plausible estimates calculated with the best available data and methods, and they are instructive to understand the scale of coal's impact and to provide a foundation for future refinements.

With these caveats in mind, we report the revenues, expenditures, and net impact figures estimated in this report (see Table 28). The industry alone contributed \$8.5 million to the GF from the direct payment of taxes, as well as an additional \$6.6 million indirectly as a result of local mineral property taxes, resulting in a combined benefit to the state budget of \$15.1 million. The state does not collect coal-specific transportation-related taxes. The largest source of direct revenues for the state was the industry's remittances of the sales and use tax, which accounted for 75% of all state revenues generated from coal industry activity. Overall, including the contribution of local property taxes, the coal industry directly accounted for approximately 0.1% of total state revenues in FY2009.

In terms of the associated costs to the state attributable to the coal industry, we estimate that total on-budget expenditures supporting the industry amounted to approximately \$11.2 million in FY2009. This consisted of \$9.7 million in expenditures from the GF for agency expenditures, and \$1.5 million from the TF for repairs to roadways required as a result of damage from overweight coal trucks. The greatest agency expenditure from the GF was for VDMME.

Comparing on-budget expenditures to direct industry revenues (including local property tax revenues), we estimate that the direct impact of the coal industry amounted to a net benefit to the Commonwealth of \$3.9 million in FY2009. However, this estimate does not account for the tax expenditures supporting the coal industry (as represented by tax credit refunds to coal companies).

**Table 28: Summary of revenues, expenditures, and net impact of coal for FY2009**

Item	General Fund	Transportation Fund	Total
<b>Direct coal industry</b>			
Revenues	\$15,050,000	\$0	\$15,050,000
On-budget expenditures	(\$9,650,000)	(\$1,500,000)	(\$11,150,000)
<b>Estimated net impact</b>	<b>\$5,400,000</b>	<b>(\$1,500,000)</b>	<b>\$3,900,000</b>
Coal tax credit refunds	(\$14,200,000)	not calculated	(\$14,200,000)
<b>Total net impact, direct coal industry</b>	<b>(\$8,800,000)</b>	<b>(\$1,500,000)</b>	<b>(\$10,300,000)</b>
<b>Direct coal employment</b>			
Revenues	\$20,190,000	\$2,940,000	\$23,130,000
Expenditures	(\$17,080,000)	(\$2,940,000)	(\$20,020,000)
<b>Estimated net impact</b>	<b>\$3,110,000</b>	<b>\$0</b>	<b>\$3,110,000</b>
<b>Indirect employment supported by coal</b>			
Revenues	\$30,980,000	\$7,850,000	\$38,830,000
Expenditures	(\$45,660,000)	(\$7,850,000)	(\$53,510,000)
<b>Estimated net impact</b>	<b>(\$14,680,000)</b>	<b>\$0</b>	<b>(\$14,680,000)</b>
<b>Total</b>			
Revenues	\$66,220,000	\$10,790,000	\$77,010,000
Expenditures	(\$86,590,000)	(\$12,290,000)	(\$98,880,000)
<b>Estimated net impact</b>	<b>(\$20,370,000)</b>	<b>(\$1,500,000)</b>	<b>(\$21,870,000)</b>

Total off-budget tax expenditures in the form of tax exemptions, credits, and preferential tax rates amounted to approximately \$37.4 million in FY2009. However, only the credit value refunded to coal companies whose credit benefits exceeded the company's total tax liability is represented as a direct cost to the state. This refunded value amounted to \$14.2 million in FY2009. As described in Section 4, rather than promoting new coal industry activity and therefore an increase in jobs and tax revenues, the tax expenditures supporting coal instead impose a net cost on the state and its taxpayers, both directly and in the form of foregone revenues. This is due to the fact that taxes represent only a small part of the overall cost of doing business, and that uncontrollable factors, such as market forces, have a much greater effect on coal production and employment than tax rates. The most significant tax expenditure on the coal industry was the Coalfield Employment Enhancement Tax Credit, which resulted in foregone revenue amounting to \$22.2 million.

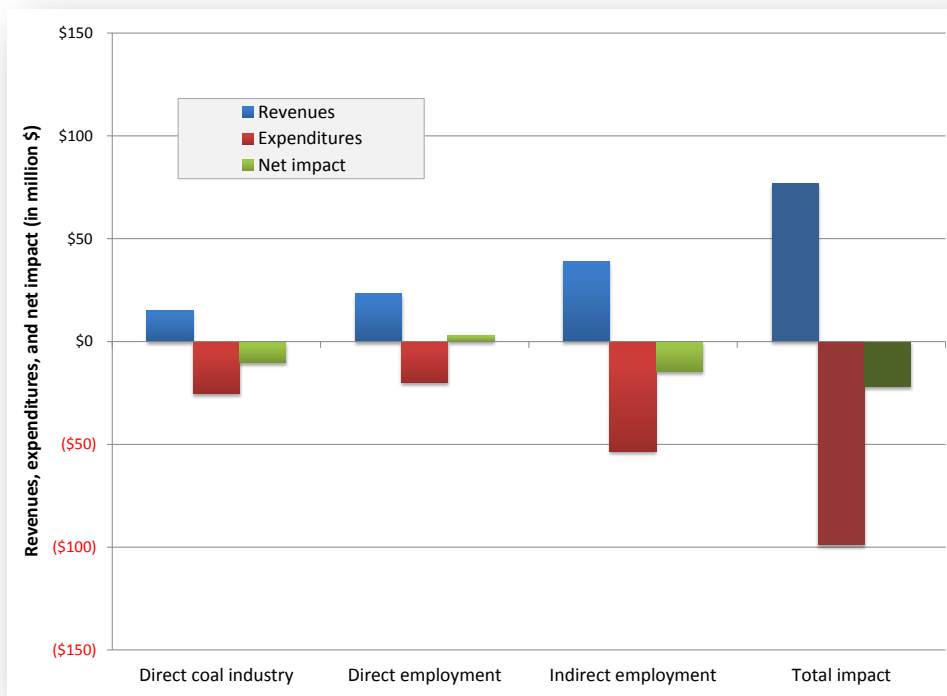


Direct coal employment also contributed \$20.2 million to the GF and \$2.9 million to the TF, for a total estimated benefit to the state budget of approximately \$23.1 million for FY2009. These revenues were from the payment of individual income taxes—which accounted for 57% of revenues—as well as state sales and use taxes (28%), transportation-related taxes and fees (13%), and other tax sources (3%). State expenditures for supporting those employees through the provision of various services amounted to approximately \$20.0 million, resulting in an estimated net benefit to the state of \$3.1 million.

Employment indirectly supported by the coal industry generated an estimated \$31.0 million for the GF and \$7.9 million for the TF in FY2009. Again, individual income taxes accounted for the greatest share at 48%. Estimated state expenditures supporting indirect coal-related employment amounted to approximately \$53.5 million. Therefore, indirect coal-related employment resulted in a net cost to the state of approximately \$14.7 million in FY2009. This result differs from that for direct coal employees because the average wage of indirect employees was significantly lower than the average wage for direct employees.

Overall, when taking all revenues and expenditures into account, we estimate that the impact of the coal industry on the Virginia state budget in FY2009 amounted to a net cost to the state of \$21.9 million, resulting from a net cost to the GF of \$20.4 million and a net cost to the TF of \$1.5 million. Examining the impact of the industry and its employees alone, and not accounting for tax expenditures or the impacts of indirect employment, we estimate a net benefit to the state of \$7.0 million. However, including tax expenditures and indirect employment is important for examining the overall impact of the coal industry on the state budget.

**Figure 12: Summary of the net impact of the coal industry on the Virginia state budget (by category)**



### 8.3 Legacy costs

Our net impact analysis also does not account for the legacy costs resulting from past coal industry activities. For this report, this includes the future lack of funding for reclamation of AMLs. VDMME reports that \$437 million will be required to complete reclamation and water treatment of the remaining, unreclaimed pre-1977 mine sites. However, federal funding for AML reclamation efforts is set to expire in 2022, and it is expected that total state funding by then will amount to only \$125 million, meaning that unless federal funding is continued, the remainder of the debt—amounting to \$312 million—would have to be paid by the state, or the remaining sites left to pollute indefinitely.

The projected legacy cost remaining after 2022 is likely an underestimate because state agencies do not always address water quality discharges to the extent that surface water quality standards are met. In addition, the database of AMLs may not be entirely complete, and new AML sites may be listed in future years. Finally, the estimate of funds to be distributed through 2022 is only a hypothetical estimate that assumes that coal production levels will be maintained. However, coal production in Virginia is likely to decline significantly by 2020. Should this occur, Virginia may not receive the full estimated level of funding.

Overall, the legacy costs associated with past and future coal industry activity must be considered in examining the total impact on the state. External costs resulting from coal industry activity, including the costs to human health, for repairing damage to personal property, and the value of lost economic opportunities resulting from the loss of clean water and timber resources, for instance, were not considered in this report. However, they all represent real costs to society, and should be considered in any full accounting of the benefits and costs of the coal industry.

### 8.4 Future trends

Should coal production in Virginia decline as projected, the economic benefits currently provided by the coal industry in terms of jobs and tax revenues will decline as well (McIlmoil and Hansen, 2010). Based primarily on economic factors related to production costs and a shift in energy markets toward greater use of natural gas for electricity generation, EIA projects that Central Appalachian coal production will decline 51% below 2008 levels by 2015 (EIA, 2010g). Based on that projection, we estimate that annual coal production in Virginia could fall by 12.4 million tons through 2015 compared to 2008 levels. This would negatively impact revenues associated with the coal industry and its employees, and to some extent, with indirect coal employment. New regulations related to air emissions and tighter restrictions on surface mining are also likely to impact Virginia coal production, although to what extent is unknown. Therefore, understanding the net impact of coal on the Virginia state budget is important in considering how to react to these changes—whether to continue to place significant governmental support behind coal, or to shift budgetary and political priorities in order to support emerging industries and economic diversification.

## 8.5 Recommendations

Based on our findings and conclusions, we provide several recommendations aimed at minimizing future costs to the state attributable to the coal industry, and incentivizing new forms of economic development that will help diversify local economies in Virginia's coal-producing counties. We note that some of the policy recommendations presented below complement others, in that the fiscal impact of one recommendation may support the financing of another. Additionally, other policy changes may be required beyond those suggested here in order to address other problems associated with the coal industry.

There is strong evidence suggesting a need for policy changes related to coal and economic development in Virginia. Virginia's coal-producing counties continue to experience some of the highest poverty and unemployment rates in the nation and are facing additional economic challenges due to the decline in coal production. Lacking sufficient financial and policy mechanisms aimed at supporting new economic opportunities, the economic condition of these counties will only worsen as coal production declines in the coming years. Given that, three of our key recommendations are as follows:

### **Eliminate the Coalfield Employment Enhancement Coal Employment and Production Incentive tax credits.**

One of the reasons that coal's revenue contribution is so small is that the state is losing \$32.2 million in potential tax revenue as a result of the Coalfield Employment Enhancement and Coal Employment and Production Incentive tax credits. JLARC's 2012 analysis of these two credits found that: (1) declines in Virginia coal mining activity have been unaffected by the tax credits, as both production and employment have declined to an equal or greater extent than was predicted to occur without the tax credits; (2) external and uncontrollable factors appear to drive production and employment, and tax credits are unlikely to meaningfully counteract these negative factors; (3) the tax credits reduced average coal company tax liability by 135% for TY2008; and, (4) a portion of the refunded credits for economic diversification benefit the coalfield region, but unemployment remains high. As a result, JLARC concludes that the tax credits have failed to achieve the intended goal of supporting and enhancing coal production and mining employment, and therefore represent a cost to the Commonwealth and significant loss of annual GF revenue.

**Increase funding for the Virginia Coalfield Economic Development Authority and expand the organization's scope of work related to economic diversification.** According to its annual reports, VACEDA received an average of \$12.5 million in annual income between 2008 and 2011, and approved an average of \$9.1 million in annual grants and loans for financing economic development projects (VACEDA, 2012). While this is a substantial amount of money being invested each year, it is not sufficient for supporting widespread economic diversification. Additionally, financing decisions are based in part on the number of jobs to be created, wage rates and the amount of private investment being contributed. As such, programs that focus on laying the groundwork for lasting economic development are not supported by VACEDA. To remedy this, the state could increase funding for VACEDA while requiring that a portion of VACEDA's work focus on developing programs such as early childhood development, education, infrastructure development and workforce training, among others.

**Create a Permanent Mineral Trust Fund.** To prepare for the projected decline in state coal production, Virginia should create a permanent mineral trust fund that would support short-term and long-term economic development goals and ensure against potential declines in jobs and revenues provided by the coal industry. The fund could be financed through the elimination of existing tax expenditures supporting the coal industry and a dedication of the resulting revenues to the fund, or, as in other states, through a state severance tax. Monies from the fund would be dedicated toward supporting economic diversification efforts in Virginia's coal-producing counties and could be administered by VACEDA. Several western states have created permanent funds with dedicated severance tax dollars. New Mexico, for example, uses the interest (4.7%) from its \$3.5 billion Severance Tax Permanent Fund to pay for general revenue spending, and uses the principal to ensure that it has financial resources available for when its natural resources have been depleted.

In Section 9, we detail, analyze, and project the financial benefits of a combined policy recommendation consisting of: (1) eliminating the Employment Enhancement and Coal Employment and Production Incentive tax credit, (2) distributing the majority of the new corporate income tax revenues to VACEDA, and (3) using the remaining revenues to establish a permanent mineral trust fund. We recommend this approach because as coal production in Virginia declines in the future, the potential loss of state revenues will make it even more difficult to cover the annual and legacy costs of coal while also supporting economic diversification strategies for southwest Virginia’s coal-producing counties.

Two additional recommendations include:

**Ensure that funds for reclamation and water treatment of abandoned mines are sufficient for meeting all present and future needs.** While general revenues are not currently used for AML reclamation, there is a significant likelihood that current funding streams will be insufficient to meet all present and future needs. In fact, VDMME and OSMRE estimates suggest a funding shortfall of \$312 million. If and when shortfalls occur, there will be a need to find alternative funding sources, and one potential source is the GF. To prevent this from happening, we recommend that the General Assembly explore mechanisms for generating new sources of revenue aimed at overcoming funding shortfalls expected to exist if AML funding expires, as scheduled, in 2022. The goal should be to ensure that remaining reclamation costs are not shifted from the coal industry to the public.

**Require responsible fiscal accounting to better inform governmental budgetary decision-making.** Many industries benefit the Commonwealth by providing jobs and tax income; however, some also cost the state via on- and off-budget expenditures. The true value or impact of a given industry can only be accurately assessed if both the positive and negative effects are accounted for and then compared against governmental intent. Recently, the Commonwealth has made great strides in improving transparency on fiscal matters and governmental expenditures. This effort is most clearly demonstrated by the facility of the website “Commonwealth Data Point” (VAPA, 2011), which is an excellent resource for demographic and economic data for the state. However, the accessibility of the data is only one step towards responsible fiscal accounting for budgetary decision-making in the General Assembly and various state agencies. Responsible fiscal accounting would use accurate expenditure data and compare the listed expenditures against legislative intent, assessing whether the expenditure on a given item aligns with stated budgetary priorities. Further, responsible fiscal accounting requires the balancing of both the positive and negative impact of a given budgetary decision. We recommend that this type of assessment be carried out for a variety of programming, but most especially that which benefits certain industries.

In this report we provide initial estimates of the benefits and costs of Virginia’s coal industry. We invite refinements of this analysis, and recognize that revised agency accounting practices that generate data on the impact of each industry would help facilitate these calculations for the coal industry, and indeed, any industry operating in the Commonwealth. We conclude that Virginia’s coal industry presents a net cost to the state budget. As such, it is strongly recommended that state policy related to energy and economic development—to the extent that it supports the coal industry—should be reconsidered, and new policies should be enacted that reflect a recognition of these realities.

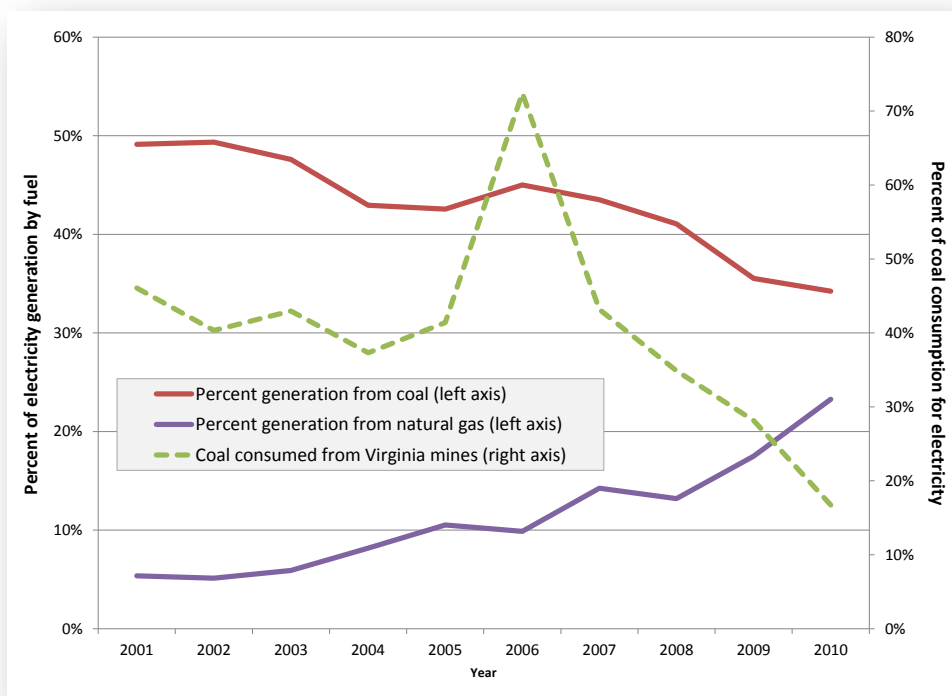
## 9. KEY RECOMMENDATION: FUNDING ECONOMIC DIVERSIFICATION IN VIRGINIA'S COALFIELD COUNTIES

### 9.1 Context

Coal is a finite resource, and its extraction is prone to periods of growth and decline. The decision of whether to produce a ton of coal is also largely dependent upon market forces that govern whether producing that ton is economical. For instance, when the market price of coal is high, the price may be sufficient for recovering the cost of producing marginal reserves that would otherwise be uneconomical to produce. However, on the other hand, as a result of the higher price, competition from lower-cost fuels and/or additional costs associated with regulatory compliance, for instance, overall demand for coal from a particular state or basin may decline.

These factors have played a large role in the decline of coal production in Virginia since 1998. As Virginia's most accessible coal seams have been depleted, production costs have risen, and as a result demand for coal from other states and, more recently, demand for natural gas have begun replacing demand for Virginia coal. As an illustration of this trend, the percent of coal burned by Virginia's electric utilities and independent power producers that originated from Virginia coal mines dropped from 46% in 2001 (and as high as 72% as recently as 2006) to 17% by 2010. In addition, coal's share of total electricity generation in Virginia has fallen from 49% in 2001 to 34% in 2010, while the share of total generation from natural gas has risen from 5% to 23% over the same period (see Figure 13) (EIA, 2011a and b; 2012a and b).<sup>46</sup>

**Figure 13: Trends in Virginia electric utility demand for coal and Virginia-mined coal, 2001-2010**

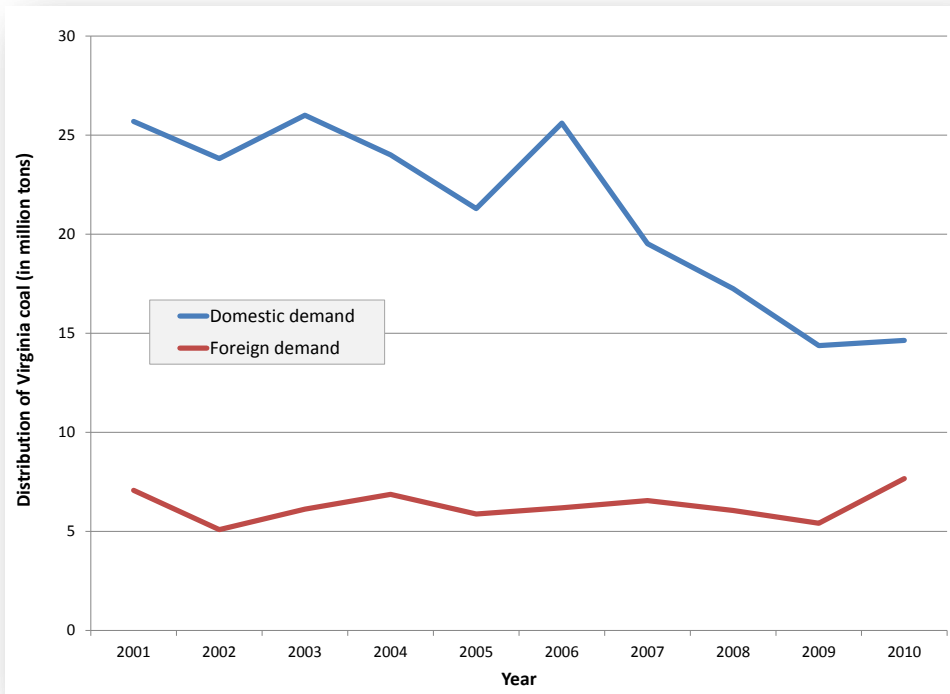


Source: EIA (2011a and b; 2012a and b)

<sup>46</sup> The data and analysis presented in this section represent more recent information than has been presented throughout this report. This is the result of the client requesting more accurate projections of the future impact of the proposed recommendations.

At the same time that domestic demand for Virginia coal has been declining, global demand for coal from the US has been increasing, and EIA projects this trend will continue. However, as shown in Figure 14, despite the fact that Virginia coal producers have greater access to coastal ports than most other Appalachian states, foreign exports of Virginia coal remained at approximately 2001 levels in 2010, and have thus far failed to make up for the decline in domestic demand.

**Figure 14: Domestic and foreign demand for Virginia coal, 2001-2010**



Source: EIA (2011b; 2012b).

Despite the fact that some Central Appalachian coal companies are benefiting somewhat from a rise in global demand for US coal, overall, total demand for Central Appalachian coal is declining, and EIA projects that the trend will continue as Central Appalachian coal production is projected to decline 60% from 2010 levels by 2020 (EIA, 2012c). If this projection proves accurate, coal production in Virginia faces a similar decline.

Given the likelihood of a significant decline in production and resulting declines in coal-related jobs and tax revenues, the Commonwealth of Virginia could insure against such losses by capturing coal-related revenues and converting the revenues into a more sustainable source of funding for diversifying Virginia’s coalfield economy. One manner in which this may be accomplished is by (1) eliminating the Employment Enhancement and Coal Employment and Production Incentive tax credit, (2) distributing the majority of the new corporate income tax revenues to VACEDA, and (3) using the remaining revenues to establish a permanent mineral trust fund. This section details the benefits of this approach.

## 9.2 Eliminating the Employment Enhancement and Coal Employment and Production Incentive tax credits

As described in Section 4, a JLARC study on the effectiveness of Virginia’s tax credits found that the Employment Enhancement Tax Credit and Coal Employment and Production Incentive Tax Credit reduced average coal company tax liability in FY2009 to such an extent that the value of the credits redeemed exceeded the average tax liability. As a result, the state actually ended up paying coal companies and owners an additional \$14.2 million in refundable credits beyond what the total coal company tax liability would have been (JLARC, 2012). The study further concluded that:

1. declines in Virginia coal mining activity appear to have been unaffected by the tax credits;
2. external and uncontrollable factors appear to drive production and employment while tax credits fail to meaningfully counteract these factors; and
3. while allocating a portion of the refunded credits to VACEDA to promote economic diversification benefits the coalfield region, unemployment remains high, and coal tax credits may not be the most efficient mechanism to fund economic diversification (through VACEDA).

In response to JLARC’s conclusions, a report was commissioned by the Virginia Coal Association and conducted by Chmura Economics and Analytics (“Chmura”). The report claimed—despite the fact that coal production and employment declined further than was estimated in 1995—that without the Employment Enhancement Tax Credit, “it is safe to assume that coal production and employment would have declined even further” (Chmura, 2012, p. 8). No evidence or analysis is provided to support this assumption.

Additionally, the report credits the full 18,600 jobs created by VACEDA to the existence of the tax credit, and by extension, claims that without the credit the unemployment rate in southwest Virginia would have been 18.5% in 2011 rather than 7.3%. However, VACEDA receives no more than 15% of the tax credit value in any given year, and according to their annual reports, the organization received an average of just over \$3 million a year from the credit from 2008 to 2011 (VACEDA, 2012). This tax credit contribution amounts to an annual average of only 25% of VACEDA’s total income over this time period.

Therefore, it can be concluded that the Chmura report inflated the direct impact of the credit by associating the total impact of VACEDA’s economic development work to the existence of the tax credit. In reality, VACEDA’s work and achievements are primarily made possible by non-credit sources of funding. It is also important to recognize that instead of promoting new coal industry activity and therefore an increase in jobs and tax revenues, the tax credits instead impose a net cost on the state and its taxpayers. And finally, as JLARC concluded, external and uncontrollable factors, such as market forces, have a much greater effect on coal production and employment than do tax credits and tax rates. This conclusion is supported by numerous other studies that have analyzed the effect of taxes and tax credits on natural resource production.

For instance, a review of numerous studies analyzing the impact of tax rates on energy production found that tax rates have little impact on production, while significantly reducing state tax revenue (O’Leary, 2011). The same study found the inverse to be true as well—that higher production taxes on oil and gas had only a small effect on production but resulted in substantial increases in state revenue (O’Leary, 2011). A primary explanation given is that taxes represent only a small part of the overall cost of doing business—particularly for extraction industries that experience lower-than-average tax liabilities—and that wages and transportation costs can have a greater impact on production than changes in tax rates (O’Leary, 2011). In the case of coal, prices—and therefore, to a large extent, demand and production—are predominantly determined by domestic and foreign markets, not taxes.

Based on the evidence provided herein, it may be of great benefit for the Commonwealth of Virginia to eliminate the Employment Enhancement Tax Credit and Coal Employment and Production Incentive Tax Credit. As reported in Section 4, the cost of the two credits in FY2009 amounted to \$32.2 million. Using EIA data for coal production by state, VDMME data for coal produced by mine type and seam thickness, and EIA's projections for future Central Appalachian coal production, we estimate that eliminating the credits will generate an average of \$19.2 million in annual tax revenues for the state from 2014 to 2035. Total revenues generated would amount to approximately \$420 million. To ensure that these revenues continue to support and even enhance the work of VACEDA, a substantial portion of the new revenues could be earmarked for VACEDA funding.

### **9.3 Distributing the majority of new tax revenues to the Virginia Coalfield Economic Development Authority**

Based on information provided in the Chmura report, it is evident that VACEDA has had a beneficial impact on local economies in southwestern Virginia's coal-producing counties, supporting 18,600 jobs and generating annual gross revenues of \$3.3 billion (Chmura, 2012). However, more work is needed. Unemployment remains above the state average, and economic diversity remains well below the state average (Chmura, 2012; Boettner et al., 2011). Therefore, given the need for greater economic development funding in Virginia's coalfields, and that the additional tax revenues generated by the elimination of the two coal tax credits would have negligible impact on the state budget, the majority of the new revenues from eliminating the credits could be earmarked for increasing funding for VACEDA.

Based on our projections for the value of the two credits through 2035, and using a base income level for VACEDA of \$12.5 million (representing an approximate average annual income from 2008 to 2011), we find that distributing 75% of the new revenues to VACEDA (and subtracting out the current tax credit funding of \$3 million) would result in an average annual increase in VACEDA's total funding of 91% from 2014 to 2035. In year 1, VACEDA's annual income would increase from \$12.5 million to \$34.5 million, nearly tripling the amount of funds available for promoting economic development. As a result of the decline in coal production, however, the amount of new revenues would decline in future years.

To enhance the impact of the new revenues, guard against future declines in revenue, and ensure that the revenues have a lasting, sustainable impact far beyond 2035, the remaining 25% of new revenues could be deposited into a permanent mineral trust fund.

### **9.4 Establishing a permanent mineral trust fund**

Permanent mineral trust funds, or "permanent funds," help ensure a permanent source of wealth from the extraction of finite resources such as coal, natural gas, and oil—wealth that will last and continue to grow even during "bust" periods. Even more, after the resource has been exhausted, they also support economic development and diversification for state and local economies (O'Leary, 2011).

As of 2011, six states with strong natural resource extraction industries had created permanent funds, each of which is funded by a severance tax and/or lease payments collected on the extraction of the state's minerals (Boettner et al., 2012) (see Table 29). The states direct a portion of the revenues into the fund, and the principal is invested in any number of ventures promising a return on the investment. A percentage of the investment income is then made available for funding public needs (Boettner et al., 2012).

The manner and amount of revenue collected and deposited into each fund varies among states, ranging from a severance tax of 2.5% on the value of all minerals produced in Wyoming to 30% of total oil and gas tax collections in North Dakota. Additionally, while some states transfer the investment earnings into the general fund, others use it to fund infrastructure, economic development, and education (Boettner et al., 2012).



**Table 29: Permanent mineral trust funds in other producing states**

State	Trust fund name	Year created	Revenue source	Revenue in 2010/2011	Principal in 2010/2011
Alaska	Alaska Permanent Fund	1976	25% of oil income	\$887 million	\$38.2 billion
Montana	Coal Severance Tax Trust Fund	1976	50% of coal severance tax	\$22 million	\$836 million
New Mexico	Severance Tax Permanent Fund	1973	12.5% of total severance tax	\$3.5 million	\$3.6 billion
North Dakota	Legacy Fund	2010	30% of coal and oil severance tax	\$613 million	\$613 million
Utah	State Endowment Fund	2008	Severance tax revenues in excess of set amounts	\$0	\$23 million
Wyoming	Permanent Mineral Trust Fund	1974	2.5% severance tax on gas/oil	\$290 million	\$5.4 billion

Source: Boettner et al. (2012).

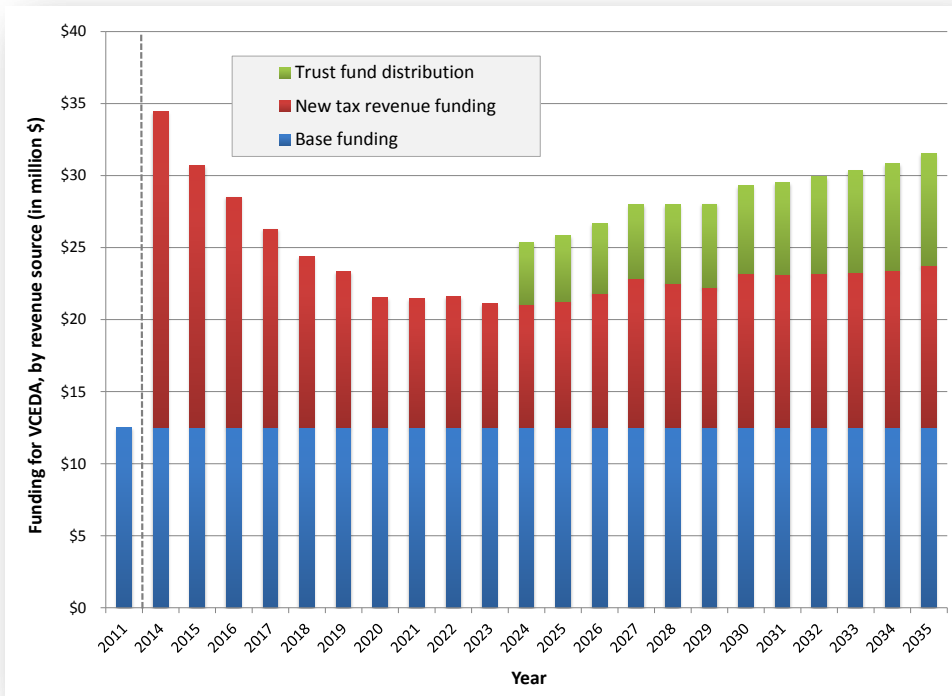
For Virginia, such a trust fund could be financed with the remaining 25% of the new tax revenues resulting from the elimination of the coal tax credits. The revenues would be deposited into the fund each year, and each year the growing principal would earn interest, further growing the fund, much like a public pension fund. To model the financial impact of the fund, we assume that the principal would earn an average annual interest of 7%, which is the current assumed interest rate for the Virginia Retirement System investment fund for public pensions (Virginia Retirement System, 2011).

Since the initial deposit of 25% of new tax revenues represents a relatively small infusion into the fund in the early years, it is recommended that the principal remain untouched for the first ten years the fund is in place. This would allow the fund to grow at a greater rate. After the first ten years, starting in 2024, 5% of the principal remaining at the end of each year could then be withdrawn and provided as supplemental funding for VACEDA. From 2024 to 2035, the average annual disbursement would amount to \$6.0 million, with total funds disbursed amounting to \$71.5 million.

## 9.5 Results

If Virginia were to implement the recommendation and the model outlined in this section, we project that VACEDA's average annual funding in future years would more than double relative to current levels, increasing by 117% from \$12.5 million in 2011 to an average of \$27.1 million from 2014 to 2035 (see Figure 15). Total new funding for VACEDA through 2035 would amount to approximately \$320 million. Additionally, the remaining principal in the trust fund would amount to approximately \$150 million, which would continue to grow and provide funding for economic diversification beyond 2035 regardless of whether coal production continues.

**Figure 15: Future funding for the Virginia Coalfield Economic Development Authority, 2014-2035**



## APPENDIX A: COUNTY-LEVEL COAL-RELATED REVENUE

Virginia’s coal-producing counties—Buchanan, Dickenson, Lee, Russell, Tazewell, and Wise counties—are demographically dissimilar from other counties in the Commonwealth (Table 30). On average, these counties have lower population densities, lower median household incomes, higher unemployment rates, and smaller schools than the average of all counties in the Commonwealth. According to Virginia’s Department of Housing and Community Development’s Commission on Local Governments (VCLG), in 2007/2008, all six of the coal-producing counties were classified as “High stress” or “Above average stress” in a composite fiscal stress index (VCLG, 2010).<sup>47</sup> This means that, relative to other counties in Virginia, these six counties experienced some degree of increased “financial hardship at the local level” (VCLG, 2010, p. 19). Furthermore, according to the ARC’s rating of socioeconomic status in FY2009, five of these counties fall in the bottom 50% of all the 420 counties in Appalachia, and all but Tazewell County are designated as either “Distressed” or “At-Risk” (ARC, 2009).

**Table 30: County demographics for coal-producing counties in Virginia, 2009**

	All counties	Buchanan	Dickenson	Lee	Russell	Tazewell	Wise
Population density (persons/square mile)	240	49	50	59	62	86	103
Median household income	\$40,353	\$22,213	\$23,431	\$22,972	\$26,843	\$ 27,304	\$26,149
Unemployment rate	4.64%	5.10%	5.80%	5.30%	5.80%	4.40%	4.60%
Fiscal stress rating	N/A	High	High	Above average	Above average	Above average	High
ARC socioeconomic stress rating	N/A	At-risk	Distressed	At-risk	At-risk	Transitional	At-risk

Source: VAPA (2009); ARC (2009). Note: ARC denotes “Appalachian Regional Commission.”

As summarized in Section 2, coal companies operating in the Commonwealth contribute directly to the state’s GF through the corporate income tax and remittance of the state sales and use tax and indirectly through the payment of local taxes that reduce the financial burden on the state for funding certain programs such as education. Additionally, coal-related employees contribute via the payment of individual income tax and other minor taxes, including the tax on recordation of deeds and conveyance.

In the Commonwealth of Virginia, as in all other Central Appalachian states, the coal industry has an impact on county and city budgets that is separate from its impact on the state budget. While Virginia authorizes few coal-specific taxes on the state level, it does authorize counties and cities to levy their own coal-specific local taxes, including the coal severance tax, local coal and gas road improvement and VACEDA tax, and taxes on mineral properties.<sup>48</sup> The coal-producing localities of Buchanan, Dickenson, Lee, Russell, Tazewell, and Wise counties have substantial coal-specific revenues, which are itemized in Table 31.

<sup>47</sup> 2007/2008 is the most recent year that VCLG had tabulated and published these data.

<sup>48</sup> Virginia Codes 58.1-3712, 58.1-3713, and 58.1-3286, respectively

**Table 31: Share of county revenues contributed by coal companies, FY2009**

County	Total county revenues (million \$)	Total local revenues only (million \$)	Local coal-related revenues (million \$)	Coal as a percent of total	Coal as a percent of local
Buchanan	\$86.8	\$44.6	\$21.2	24%	48%
Dickenson	\$55.6	\$25.0	\$12.9	23%	52%
Lee	\$66.0	\$15.9	\$0.4	1%	3%
Russell	\$78.1	\$28.7	\$4.2	5%	15%
Tazewell	\$113.1	\$44.6	\$2.6	2%	6%
Wise	\$116.9	\$44.6	\$13.1	11%	29%
<b>Total</b>	<b>\$516.5</b>	<b>\$203.4</b>	<b>\$54.4</b>	<b>11%</b>	<b>27%</b>

Source: All data taken from VAPA (2010e) except for revenues from mineral property taxes, which were provided by each county's commissioner of revenue, treasurer's office, or county assessor's office. Note: Total county revenues include all local revenues plus state and federal funds distributed to each county; local revenues reflect only the revenues generated through the collection of local taxes.

The coal-specific revenues in Table 31 reflect revenue from the three coal-specific local taxes mentioned above. Localities are only authorized to levy taxes where the state has given them the authority to do so (Menkes, 2010). Coal-producing counties, including all six that produced coal in 2008 and 2009, have used this authority to levy a coal severance tax:

“Localities are... authorized to levy a license tax on every person engaging in the business of severing coal or gases from the earth at a maximum rate of 1 percent of the gross receipts from the sale of coal or gases severed. Prior to enactment of this act, gross receipts constituted the fair market value measured at the time the [coal or] gases were utilized or sold for utilization in the locality or at the time they were placed in transit for shipment from the locality, without any deductions”<sup>49</sup> (Weldon Cooper Center for Public Service, 2008, p. 7).

Likewise, these same localities have elected to enact a tax commonly known as the Coal Road Improvement Tax and formally known as the Coal and Gas Road Improvement Tax, which was originally authorized by the state in 1978. This tax, “a maximum rate of 1% of the gross receipts from the sale of gas or coal severed within the locality” is levied against all those that are candidates for the coal severance tax as well.<sup>50</sup> This tax was set to expire in December 2010, but has since been extended until December 2014. The amount is in addition to that which is collected via the severance tax, three-quarters of which is deposited in a fund dedicated to the improvement of coal and gas roads or the improvement of the water system within the county. The remaining quarter of the receipts goes to the Virginia Coalfield Economic Development Fund.

The Virginia Coalfield Economic Development Fund pays for the VACEDA, which was established by the state General Assembly in 1988. VACEDA’s mission is to “enhance the economic base for the seven county and one city coalfield region of Virginia (Lee, Wise, Scott, Buchanan, Russell, Tazewell, and Dickenson Counties, and the city of Norton).”<sup>51</sup> Commonly known as the organization that maintains “Virginia’s e-Region,” VACEDA provides financial support, coordinates real estate transactions, and incentivizes business development in the region. VACEDA does not receive any funds from the GF; instead, it is financed by income from the county severance tax and other tax credits.

In addition to the payments listed in Table 31, coal companies contribute to county budgets through payment of local sales and use taxes, transportation-related taxes, and communications sales and use taxes. Revenue from these taxes on the local level, however, is not disaggregated by industry. Therefore, they are not included in this summary analysis.

<sup>49</sup> Effective: July 1, 2009. Amended: §§ 58.1-3286 and 58.

<sup>50</sup> Virginia Code § 58.1-3713

<sup>51</sup> Virginia Code 15.2-6002

## APPENDIX B: RIMS-II AND THE USE OF ECONOMIC MULTIPLIERS

RIMS-II, created and provided by BEA, was developed primarily for estimating the economic impact of a change in economic activity for a particular industry, such as the coal industry in Virginia, or the regional impact of new projects such as an airport.<sup>52</sup>

However, economic impact multipliers are also used—by state and local governments, for instance—to calculate a snapshot estimate of the state or regional impacts of government policies or projects, or of single industries or firms located within the state or region. It is in this manner that we use RIMS-II for this study: in order to estimate the indirect impacts of the coal industry in Virginia for FY2009.

A different tool, IMPLAN, is sometimes used for similar studies (Minnesota IMPLAN Group, 2004). We use RIMS-II economic multipliers for consistency with the similar Kentucky analysis (Konty and Bailey, 2009) and our previous West Virginia (McIlmoil et al., 2010a) and Tennessee analyses (McIlmoil et al., 2010b), and because of its wide use by other universities and organizations in the Central Appalachian region.<sup>53</sup>

Both IMPLAN and RIMS-II provide impact multipliers for output and for earnings or wages. We use RIMS-II to calculate the indirect impact of the Virginia coal industry for employment and wages.<sup>54</sup> Using selected multipliers, detailed in Table 22, we then estimate the revenues and expenditures associated with indirect employment supported by the coal industry, and therefore the net impact of such employment on the Virginia state budget.

However, as a final note, it is worth repeating a note of caution expressed by MACED:

“The RIMS II, and all economic impact multipliers, is surrounded by criticism of the models based on the assumptions built into the models and the resulting limits of their applicability and accuracy. The model assumes that all direct, indirect and induced effects would not otherwise occur without the project. The absence of the counterfactual—meaning we really have no way of knowing or modeling what activities would occur without the project—is problematic. The base assumption of the RIMS II (and all multiplier models), that it places all other economic activity on hold is significant and presents obvious problems under the best circumstances. In addition to these concerns, the application of this method to an industry that has been in the region for more than 100 years and is tied to a place-specific natural resource violates basic principles of a model designed to assess the impact of economic shocks such as development projects or firm closures.” (Konty and Bailey, 2010, p. 20)

Despite these potential pitfalls, multipliers are often used by the industry itself and by researchers to estimate an industry’s indirect impacts. We perform these calculations with the recognition that, while imperfect, these multipliers allow us to clarify key issues and to perform initial, if imprecise, calculations.

---

<sup>52</sup> To do so, it accounts for inter-industry relationships within regions, measuring the impact on output (i.e., coal production) effected by a change in inputs purchased (i.e., mining machinery), and vice versa. In this way, it provides a tool for measuring how one industry, such as the coal industry, impacts other industries within a regional, state, or local economy. RIMS-II uses direct employment data, detailed information on inputs and outputs related to and generated by an industry operating in a particular geographic region, as well as consumer behavior in the region, to determine the indirect economic impacts, or “spill-over effects,” of a specific industry, firm, or development project. For instance, any change in coal production will have an impact on industries that supply coal companies with tools and machines used in the coal mining process. If coal production in Virginia increases by a substantial amount, or a new mine opens, then supply industries benefit by supplying the coal company, and employment in the supply industries will increase, thereby having an additional positive impact on wages and tax revenues. Conversely, if production declines, the industries that supply the coal industry will be negatively impacted, and employment in and revenues from those supply industries will decline.

<sup>53</sup> For instance, according to MACED, RIMS-II multipliers are used by the Kentucky Coal Association and the University of Kentucky Center for Business and Economic Research (Konty and Bailey, 2009).

<sup>54</sup> The multipliers selected were the direct effect, Type II, benchmark series multipliers for the Virginia coal industry (NAICS code 2121) Type II series provide total impact multipliers that include both indirect and induced impacts, whereas Type I series provides only direct impact. Benchmark series multipliers are available for detailed industries, such as NAICS 2121 for the coal industry. The alternative was to choose the annual series multipliers, which are only available for aggregated industries, such as “Mining,” which includes all forms of mining.

## REFERENCES

- Abbott, Michael D (2010a) Public Relations Manager, Virginia Department of Mines, Minerals, and Energy. Email correspondence with author Hartz, Oct. 7. File "Budget File for Mike.xls"
- \_\_\_\_\_ (2010b) Public Relations Manager, Virginia Department of Mines, Minerals, and Energy. Memorandum. Subject "Request for Virginia Regulatory Coal Program Data". Sep 27.
- Appalachian Regional Commission (ARC) (2010) County Economic Status, Fiscal Year 2011: Appalachian Virginia. [http://www.arc.gov/reports/region\\_report.asp?FIPS=51999&REPORT\\_ID=36](http://www.arc.gov/reports/region_report.asp?FIPS=51999&REPORT_ID=36) Accessed Oct 19.
- \_\_\_\_\_ (2009) Data reports: county economic status, Fiscal Year 2009. Accessed December 20, 2010. <http://www.arc.gov/data>
- Berger, James (2010) Telephone conversation with Author Hartz. Dec 7.
- Boettner, Ted, Jill Kriesky, Rory McIlmoil and Elizabeth Paulhus (2012) Creating an economic diversification trust fund: Turning nonrenewable natural resources into sustainable wealth for West Virginia. Jan. <http://wvpolicy.org/downloads/WVEconomicDiversificationTrustFundRpt021312.pdf>
- Buckley, Rick (2010) Supervisory Program Specialist, US Office of Surface Mining Reclamation and Enforcement, Charleston Field Office. Excel spreadsheet detailing national partners information as of September 30, 2009, provided to author Hartz via email. Jan 6.
- Chmura Economics and Analytics (2012) The economic impact of the coal industry in Virginia. Dec 18. [http://www.chmuraecon.com/pdfs/CoalIndustry\\_EconomicImpact.pdf](http://www.chmuraecon.com/pdfs/CoalIndustry_EconomicImpact.pdf)
- The Commonwealth Institute (2009) A drop in the bucket? Assessing the high cost of Virginia Tax Expenditures. Nov. [http://www.thecommonwealthinstitute.org/wp-content/uploads/2011/08/091109\\_drop\\_in\\_the\\_bucket\\_REPORT.pdf](http://www.thecommonwealthinstitute.org/wp-content/uploads/2011/08/091109_drop_in_the_bucket_REPORT.pdf)
- Cope, Susan (2011) Lee County Commissioner of Revenue. Email correspondence with author McIlmoil. Oct 18.
- DiFazio, Faye (2010) Fiscal Director, Fiscal Division, Virginia Department of Forestry, "Estimated Amount of Funds Allocated to Coal-producing Counties" to author Hartz. Aug 25.
- DuBois, Glen (2009). Virginia Community College Chancellor. "Investing in Education" television interview on FOX Business News. Jul 17. Accessed Jan 19, 2011. <http://www.vccs.edu/NewsEvents/tabid/264/Default.aspx>
- Edwards, Linda (2011) Dickenson County Commissioner of Revenue. Telephone conversation with author McIlmoil. Oct 14.
- Energy Information Administration (EIA) (2010a) Annual Coal Report, Table 15. Recoverable Coal Reserves at Producing Mines, Estimated Recoverable Reserves, and Demonstrated Reserve Base by Mining Method, 2009. Oct. <http://www.eia.doe.gov/cneaf/coal/page/acr/table15.html>
- \_\_\_\_\_ (2007) Annual Coal Report 2006. Table 28: Average Open Market Sales Price of Coal by State and Mine Type, 2006-2005. Nov. <http://www.eia.doe.gov/FTPROOT/coal/05842006.pdf>
- \_\_\_\_\_ (2009) Average Mine Price of Coal by State and Mine Type, 1978-2007. Spreadsheet provided by Mike Mellish, Economist, Energy Information Administration, Office of Integrated Analysis and Forecasting, Coal and Electric Power Division. Dec.

- 
- \_\_\_\_\_ (2010b) Domestic Distribution of U.S. Coal by Origin State, Consumer, Destination and Method of Transportation, 2008. Dec.  
[http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/2008/o\\_08state.pdf](http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/2008/o_08state.pdf)
- 
- \_\_\_\_\_ (2010c) Domestic and Foreign Distribution of US Coal by State of Origin, 2008 Final. May.  
[http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/2008/o\\_08foreign.pdf](http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/2008/o_08foreign.pdf)
- 
- \_\_\_\_\_ (2010d) Annual Coal Report 2009. Table 1. Coal Production and Number of Mines by State and Mine Type, 2009-2008. Oct 1. <http://www.eia.doe.gov/cneaf/coal/page/acr/table1.html>
- 
- \_\_\_\_\_ (2010e) Annual Coal Report 2009. Table 28: Average Sales Price of Coal by State and Mine Type, 2009-2008. Oct 1. <http://www.eia.doe.gov/cneaf/coal/page/acr/table28.html>
- 
- \_\_\_\_\_ (2010f) Net Generation by State by Type of Producer by Energy Source, Form EIA-906.  
[http://www.eia.doe.gov/cneaf/electricity/epm/table1\\_6\\_a.html](http://www.eia.doe.gov/cneaf/electricity/epm/table1_6_a.html) Accessed Sept 21.
- 
- \_\_\_\_\_ (2010g) Main Reference Case Tables (2008-2035). Table 140: Coal Production by Region and Type, Annual Energy Outlook 2011 Early Release. Dec 16.  
[http://www.eia.gov/forecasts/aeo/tables\\_ref.cfm](http://www.eia.gov/forecasts/aeo/tables_ref.cfm)
- 
- \_\_\_\_\_ (2010h) Independent Statistics and Analysis, Petroleum Navigator: Crude Oil Production. Jul 29. [http://tonto.eia.doe.gov/dnav/pet/pet\\_crd\\_crpdn\\_adc\\_mbb1\\_a.htm](http://tonto.eia.doe.gov/dnav/pet/pet_crd_crpdn_adc_mbb1_a.htm)
- 
- \_\_\_\_\_ (2010i) Independent Statistics and Analysis, Petroleum Navigator: Domestic Crude Oil First Purchase Prices by Area. Aug 6. [http://tonto.eia.doe.gov/dnav/pet/pet\\_pri\\_dfp1\\_k\\_a.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pri_dfp1_k_a.htm)
- 
- \_\_\_\_\_ (2010j) Independent Statistics and Analysis, Natural Gas Navigator: Natural Gas Gross Withdrawals and Production, Virginia. Dec 28.  
[http://tonto.eia.doe.gov/dnav/ng/ng\\_prod\\_sum\\_dcu\\_sva\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_prod_sum_dcu_sva_a.htm)
- 
- \_\_\_\_\_ (2010k) Independent Statistics and Analysis, Natural Gas Navigator: Natural Gas Prices, Virginia. Dec 28. [http://tonto.eia.doe.gov/dnav/ng/ng\\_pri\\_sum\\_dcu\\_SVA\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SVA_a.htm)
- 
- \_\_\_\_\_ (2010l) Quarterly Coal Distribution, Back Issues. All 2009 quarterly reports. Nov.  
[http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/qtr/back\\_q\\_distributions.html](http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/qtr/back_q_distributions.html)
- 
- \_\_\_\_\_ (2010m) Domestic Distribution of U.S. Coal by Origin State, Consumer, Destination and Method of Transportation. Annual Coal Distribution Back Issues (2001-2007). May 5.  
[http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/coal\\_distributions.html](http://www.eia.doe.gov/cneaf/coal/page/coaldistrib/coal_distributions.html)
- 
- \_\_\_\_\_ (2010n) Cost and Quality of Fuels for Electric Plants, 2010 Edition. Table 16: Origin and Destination of Coal to Electric Plants by State, Total (All Sectors). Dec 1.  
[http://www.eia.gov/cneaf/electricity/cq/cq\\_sum.html](http://www.eia.gov/cneaf/electricity/cq/cq_sum.html)
- 
- \_\_\_\_\_ (2010o) Cost and Quality of Fuels for Electric Plants, 2007 and 2008. Table 16A: Origin and Destination of Coal to Electric Plants by State, Total (All Sectors), 2008. Dec 1.  
<http://www.eia.gov/FTPROOT/electricity/cqa2008.pdf>
- 
- \_\_\_\_\_ (2011a) Annual (Back to 1990) Fossil Fuel Consumption for Electricity Generation by Year, Industry Type and State (EIA-906, EIA-920, and EIA-923). Nov 9.  
[http://www.eia.gov/electricity/data/state/consumption\\_annual.xls](http://www.eia.gov/electricity/data/state/consumption_annual.xls)
- 
- \_\_\_\_\_ (2011b) Domestic and Foreign Distribution of US Coal by State of Origin, 2010. Nov 30. Accessed Aug 27. <http://www.eia.gov/coal/distribution/annual/>
- 
- \_\_\_\_\_ (2012a) Net Generation by State by Type of Producer by Energy Source, Annual Back to 1990 (EIA-906, EIA-920, and EIA-923). Accessed Aug 27.  
[http://www.eia.gov/electricity/data/state/generation\\_annual.xls](http://www.eia.gov/electricity/data/state/generation_annual.xls)
-

- \_\_\_\_\_ (2012b) Annual Coal Distribution Archive, 2001-2009. Accessed Aug 27.  
<http://www.eia.gov/coal/distribution/annual/archive.html>
- \_\_\_\_\_ (2012C) Table: coal production by region and type, Reference case (2009-2035). Annual Energy Outlook. Jun 25. Accessed Aug 27 via table browser.  
<http://www.eia.gov/oiaf/aeo/tablebrowser/>
- Ferguson, Harry (2011) Russell County Assessor's Office. Telephone conversation with author McIlmoil. Oct 17.
- Hagy, Emma (2011) Tazewell County Commissioner of Revenue. Telephone conversation with author McIlmoil. Oct 14.
- Holiday, James (2011) Virginia Department of Motor Vehicles, Motor Carrier Services, Bristol District. Phone conversation with author McIlmoil. Jan.
- Informa Economics, Inc (2009) Heavier Semis: A Good Idea? Prepared on Behalf of The Soy Transportation Coalition and the United Soybean Board. Jun.  
<http://www.soytransportation.org/whatsnew/semiweightlimitreportjune09.pdf>
- Institute on Taxation and Economic Policy (ITEP) (2009) Virginia, State and Local Taxes. Nov.  
[http://www.itepnet.org/wp2009/va\\_whopays\\_factsheet.pdf](http://www.itepnet.org/wp2009/va_whopays_factsheet.pdf)
- Joint Legislative Audit and Review Commission (JLARC) (2002) Review of Elementary and Secondary School Funding. Feb 6. [http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD32002/\\$file/RD3\\_2002.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD32002/$file/RD3_2002.pdf)
- \_\_\_\_\_ (2012) Review of the effectiveness of Virginia tax preferences. Senate document no. 4. Jan.  
<http://jlarc.virginia.gov/reports/Rpt425.pdf>
- Josephs, John (2011) Senior Tax Policy Analyst, Virginia Department of Taxation. Email correspondence with Author McIlmoil. Oct 11.
- Knapp, John (2010) Weldon Cooper Center for Public Service, Center for Economic & Policy Studies. Telephone conversation with author Hartz. Jul 23.
- Konty, Melissa Fry and Jason Bailey (2009) The Impact of Coal on the Kentucky State Budget. MACED. Jun 25.  
<http://maced.org/coal/summary.htm>
- Mayer, Joe (2010) Lead Tax Policy Analyst, Virginia Department of Taxation. Phone conversation with author Hartz. Jul 22.
- McFaddin, Donna (2011) Program Support Tech, Virginia Department of Mines, Minerals and Energy, Division of Mines. Excel spreadsheet titled "2005-2006 CoalSeamData (04-11)" provided to author McIlmoil via email. Apr 13.
- McIlmoil, Rory and Evan Hansen (2010) The decline of Central Appalachian coal and the need for economic diversification. Thinking Downstream: White Paper #1. Morgantown, West Virginia: Downstream Strategies. Jan 19.  
[http://downstreamstrategies.com/Documents/reports\\_publication/DownstreamStrategies-DivisionOfCentralAppalachianCoal-FINAL-1-19-10.pdf](http://downstreamstrategies.com/Documents/reports_publication/DownstreamStrategies-DivisionOfCentralAppalachianCoal-FINAL-1-19-10.pdf)
- McIlmoil, Rory, Evan Hansen, Ted Boettner, and Paul Miller (2010a) The Impact of Coal on the West Virginia State Budget. Downstream Strategies and West Virginia Center on Budget & Policy. Jun 22.  
[http://downstreamstrategies.com/Documents/reports\\_publication/DownstreamStrategies-coalWV.pdf](http://downstreamstrategies.com/Documents/reports_publication/DownstreamStrategies-coalWV.pdf)
- McIlmoil, Rory, Evan Hansen, and Ted Boettner (2010b) The Impact of Coal on the Tennessee State Budget. Downstream Strategies and West Virginia Center on Budget & Policy. Jun 22.



[http://downstreamstrategies.com/Documents/reports\\_publication/DownstreamStrategies-coalTN.pdf](http://downstreamstrategies.com/Documents/reports_publication/DownstreamStrategies-coalTN.pdf)

McNichol, Elizabeth and Iris J. Lav (2011) A common-sense strategy for fixing state pension problems in tough economic times. May 12. <http://www.cbpp.org/cms/index.cfm?fa=view&id=3492>

Menkes, Neal (2010) A review of the state-local fiscal relationship in Virginia: Not so good and how it could get worse. The Virginia Newsletter. Nov.  
[http://www.coopercenter.org/sites/default/files/publications/Virginia%20News%20Letter%202010%20Vol.%2086%20No%206\\_0.pdf](http://www.coopercenter.org/sites/default/files/publications/Virginia%20News%20Letter%202010%20Vol.%2086%20No%206_0.pdf)

Mine Safety and Health Administration (MSHA) (2010) Part 50 Data, Address/Employment Files. Sept.  
Obtained from: <http://www.msha.gov/STATS/PART50/P50Y2K/AETABLE.HTM>

Mountain Empire Community College (MECC) (2010a). MECC Fact Book, Chapter 3. Enrollment and Student Characteristics. Annual Headcount & FTES. <http://www.me.vccs.edu/ir/3-2headcount.pdf>

\_\_\_\_\_ (2010b). MECC Foundations Annual Report, 2010.  
[http://www.me.vccs.edu/foundation/docs/annual\\_report.pdf](http://www.me.vccs.edu/foundation/docs/annual_report.pdf)

Mullins, John (2011) Master Deputy Commissioner and Chief Property Assessor. Office of the Wise County Commissioner of the Revenue. Email correspondence with author McIlmoil. Dec 20.

Office of Surface Mining, Reclamation and Enforcement (OSMRE) (2009a) Annual Evaluation Summary Report for the Regulatory and Abandoned Mine Land Reclamation Programs Administered by the Commonwealth of Virginia for Evaluation Year 2009. Sept.  
<http://www.osmre.gov/Reports/EvalInfo/2009/VA09-aml-reg.pdf>

\_\_\_\_\_ (2009b) Reclaiming Abandoned Mine Lands. Title IV of the Surface Mining Control and Reclamation Act. <http://www.osmre.gov/aml/aml.shtm>

\_\_\_\_\_ (2009c) Abandoned Mine Land Inventory System (AMLIS).  
<http://www.osmre.gov/aml/AMLIS/AMLIS.shtm> Database query as of December 29.

\_\_\_\_\_ (2009d) Fiscal Year 2009 Grant Distribution.  
<http://www.osmre.gov/topic/grants/docs/2009/FY09GrantDist.pdf>

\_\_\_\_\_ (2009e) Annual Evaluation Summary Report for the Regulatory and Abandoned Mine land Programs Administered by the Commonwealth of Virginia for Evaluation Year 2009. Sep.  
<http://www.osmre.gov/Reports/EvalInfo/2009/VA09-aml-reg.pdf>

\_\_\_\_\_ (2010) Annual Evaluation Summary Report for the Regulatory and Abandoned Mine land Programs Administered by the Commonwealth of Virginia for Evaluation Year 2010. Sep.  
<http://www.osmre.gov/Reports/EvalInfo/2010/VA10-aml-reg.pdf>

Ohio Department of Transportation (2009) Impact of Permitted trucking on Ohio's Transportation System and Economy. Jan 30.  
<http://www.dot.state.oh.us/Divisions/Legislative/Documents/ImpactofPermittedTrucking-Web.pdf>

O'Leary, Sean. 2011. Investing in the future: Making the severance tax stronger for West Virginia. West Virginia Center on Budget and Policy. Dec.  
<http://www.wvpolicy.org/downloads/SeveranceTax022812.pdf>

Padgitt, Kail (2009) 2010 State Business Tax Climate Index. Washington, DC: Tax Foundation. Sep.  
<http://www.taxfoundation.org/files/bp59.pdf>

Robyn, Mark (2009) Center for Budget and Policy Priorities Issues Report on Tax Expenditures. Tax Foundation, Tax Policy Blog. Apr 13. <http://www.taxfoundation.org/blog/show/24610.html>

- Sims, Richard G. (1980) The Fiscal Impact of the Kentucky Coal Industry. A report prepared by the Kentucky Legislative Research Commission. Sep.
- Slone, Vonda (2011) Buchanan County Treasurer's Office. Telephone conversation with author McIlmoil. Oct 17.
- Southwest Virginia Community College (SWCC) (2010a). SWCC, General College Demographics. Table 2.1: Southwest Virginia Community College Annual FTE. Accessed Oct 12. <http://www.sw.edu/ir/ir.htm>
- \_\_\_\_\_ (2010b) SWCC, College Program Related Data. Table 3.1B: Annual Unduplicated Headcount by Division & Curriculum. <http://www.sw.edu/ir/Table%203.1B.pdf>
- Stanwix, Amber (2010) Lead Tax Policy Analyst, Virginia Department of Taxation. Email correspondence with Author Hartz. Jul 15.
- US Geological Survey (USGS) (2010) Mineral Commodity Summaries, 2010. Jan 26. <http://minerals.usgs.gov/minerals/pubs/mcs/2010/mcs2010.pdf>
- US Bureau of Economic Analysis (BEA) (2010a) Regional Economic Accounts, Gross Domestic Product by State. Query: Virginia, All Industries, various years. <http://www.bea.gov/regional/gsp/> Accessed Nov 30.
- \_\_\_\_\_ (2010b) Regional Multipliers from the Regional Input-Output Modeling System (RIMS II): A Brief Description. <http://www.bea.gov/regional/rims/brfdesc.cfm> Accessed Apr 23.
- US Bureau of Labor Statistics (BLS) (2010a) State and Area Employment, Hours, and Earnings: Total Nonfarm Wage and Salary Employment, Back data. <http://www.bls.gov/eag/eag.va.htm> Accessed Nov 18.
- \_\_\_\_\_ (2010b) Quarterly Census of Employment and Wages, Multi-screen data search query: NAICS 2121 Coal mining, Virginia—statewide, 2008-2009. <http://www.bls.gov/cew/> Accessed Nov 18.
- \_\_\_\_\_ (2010c) Quarterly Census of Employment and Wages, Multi-screen data search query: Total, all industries, Virginia—statewide, 2008-2009. <http://www.bls.gov/cew/> Accessed Nov 18.
- Viard, Alan (2010) Sales Taxation of Business Purchases: A Tax Policy Distortion. Tax Analysts. Washington, DC: American Enterprise Institute for Public Policy Research. Jun. <http://www.aei.org/docLib/ViardTaxNotes062110.pdf>
- Virginia Auditor of Public Accounts (VAPA) (2011a) Commonwealth Data Point. Local Government Data: Revenues, County, FY2009. Accessed Oct. [http://datapoint.apa.virginia.gov/localgov/lg\\_rev\\_fips.cfm?TYPE=COUNTY](http://datapoint.apa.virginia.gov/localgov/lg_rev_fips.cfm?TYPE=COUNTY)
- \_\_\_\_\_ (2011b) Commonwealth Data Point. Statewide expenditures, Expenditures by Program: State Education Assistance Programs, Standards of Quality for Public Education. Accessed Oct. [http://datapoint.apa.virginia.gov/exp/exp\\_fcn\\_prg\\_ser.cfm?FCN=Education&PRG=State%20Education%20Assistance%20Programs](http://datapoint.apa.virginia.gov/exp/exp_fcn_prg_ser.cfm?FCN=Education&PRG=State%20Education%20Assistance%20Programs)
- \_\_\_\_\_ (2010a) Commonwealth Data Point. Statewide expenditures, Department of Environmental Quality. Accessed Nov. [http://datapoint.apa.virginia.gov/exp/exp\\_agy\\_fnd.cfm?AGY=104](http://datapoint.apa.virginia.gov/exp/exp_agy_fnd.cfm?AGY=104)
- \_\_\_\_\_ (2009) Comparative Report: Demographic and Tax Data for Taxable Year ending June 30, 2009.
- \_\_\_\_\_ (2010b) Commonwealth Data Point. Statewide expenditures, General Fund, Department of Environmental Quality. Accessed Nov. [http://datapoint.apa.virginia.gov/exp/exp\\_fnd\\_agy\\_prg.cfm?AGY=104&FND=General](http://datapoint.apa.virginia.gov/exp/exp_fnd_agy_prg.cfm?AGY=104&FND=General)

- \_\_\_\_\_ (2010c) Commonwealth Data Point. Statewide expenditures, Department of Taxation. Accessed Nov. [http://datapoint.apa.virginia.gov/exp/exp\\_agy\\_fnd.cfm?AGY=144](http://datapoint.apa.virginia.gov/exp/exp_agy_fnd.cfm?AGY=144)
- \_\_\_\_\_ (2010d) Commonwealth Data Point. Statewide expenditures, Department of Forestry. Accessed Nov. [http://datapoint.apa.virginia.gov/exp/exp\\_agy\\_fnd.cfm?AGY=88](http://datapoint.apa.virginia.gov/exp/exp_agy_fnd.cfm?AGY=88)
- \_\_\_\_\_ (2010e) Commonwealth Data Point. Local government data. Revenues. Accessed Apr 8, 2011. [http://datapoint.apa.virginia.gov/localgov/local\\_government\\_data.cfm](http://datapoint.apa.virginia.gov/localgov/local_government_data.cfm)
- \_\_\_\_\_ (2011) Commonwealth Data Point. <http://datapoint.apa.virginia.gov/> Accessed Jan 21.
- Virginia Coalfield Economic Development Authority (VACEDA) (2012) Annual Reports, 2008-2011. <http://www.vaceda.org/annualreport.php>
- Virginia Department of Environmental Quality (VDEQ) (2010) About the Department of Environmental Quality. Accessed Oct 6. <http://www.deq.virginia.gov/about/homepage.html>
- \_\_\_\_\_ (2000) Total Maximum Daily Load Program: A Ten Year Implementation Plan. <http://www.deq.state.va.us/tmdl/reports/hb30.pdf>
- Virginia Department of Forestry (VDof) (2010) About the Virginia Department of Forestry. Accessed Sep 15. <http://www.dof.virginia.gov/info/index.htm>
- Virginia Department of Housing and Community Development, Commission on Local Government (VCLG) (2010) Report on the revenue capacity, revenue effort, and fiscal stress of Virginia's counties and cities, 2007/2008. <http://www.dhcd.virginia.gov/CommissiononLocalGovernment/PDFs/stress08f.pdf>
- Virginia Department of Mines, Minerals, and Energy (VDMME) (2010a) About DMME. Accessed Oct. <http://www.dmme.virginia.gov/aboutus.shtml>
- \_\_\_\_\_ (2010b) Division of Mines, About. Accessed Sep 20. <http://www.dmme.virginia.gov/divisionmines.shtml>
- \_\_\_\_\_ (2010c) Division of Mined Land Reclamation. Accessed Sep. <http://www.dmme.virginia.gov/divisionmlr.shtml>
- \_\_\_\_\_ (2010d) Division of Geology and Mineral Resources. Accessed Sep 19. <http://www.dmme.virginia.gov/divisionmineralresources.shtml>
- \_\_\_\_\_ (2010e) Division of Gas and Oil. History. Accessed Sep 13. <http://www.dmme.virginia.gov/divisiongasoil.shtml>
- \_\_\_\_\_ (2010f) 1986-2009 Annual (non-fuel mineral) Production Data. <http://www.dmme.virginia.gov/DMM/productiondata.shtml> Accessed Dec 7.
- \_\_\_\_\_ (2010g) Orphaned Land Program. Accessed Sept 15. <http://www.dmme.virginia.gov/dmm/orphaned%20land.shtml>
- \_\_\_\_\_ (2011) Virginia energy patterns and trends, Summary of coal production and employment. Accessed Apr. [http://www.energy.vt.edu/vept/coal/coal\\_prod\\_dmme.asp](http://www.energy.vt.edu/vept/coal/coal_prod_dmme.asp)
- Virginia Department of Mines, Minerals, and Energy (VDMME) and Virginia Department of Environmental Quality (VDEQ) (2009) Memorandum of Agreement. Signed Dec 9. Purpose: To facilitate efficient and effective administration of applicable State and Federal laws, regulations and policies for the control of fugitive dust on and immediately adjacent to coal mining sites.

Virginia Department of Motor Vehicles (2010) Virginia's size, weight, and equipment requirements for trucks, trailers and towed vehicles. Aug 2. <http://www.dmv.state.va.us/webdoc/pdf/dmv109.pdf>

Virginia Department of Planning and Budget (2011) 2009 Executive Budget Document, Virginia Coal and Energy Commission. Accessed Jan 20.

<http://dpb.virginia.gov/budget/buddoc09/agency.cfm?agency=118>

Virginia Department of Taxation (VDT) (2010a). Annual Report FY2009.

<http://www.tax.virginia.gov/site.cfm?alias=AnnualReports> Accessed Oct 1.

\_\_\_\_\_ (2007) Mileage Tables: The State highway Systems. Dec 31.

<http://www.virginiadot.org/projects/resources/MileageTables.pdf>

\_\_\_\_\_ (2008) Taxable Sales Report. File "TSA08.XLS". Accessed Oct 5.

<http://www.coopercenter.org/node/1160>

\_\_\_\_\_ (2009a) Taxable Sales Report. File "TSA09.XLS". Accessed Oct 5.

<http://www.coopercenter.org/node/1160>

\_\_\_\_\_ (2009b) 2007–2011 Virginia Retail Sales and Use Tax Expenditure Study, Volume 1, Number 3. Dec 1.

<http://www.tax.virginia.gov/Documents/2009SUTESStudy.pdf>

\_\_\_\_\_ (2010b) Form 306, 2010 Virginia Coal Related Refundable Tax Credits: Coalfield Employment Enhancement Tax Credit and Virginia Coal Employment and Production Incentive Tax Credit.

<http://www.tax.virginia.gov/taxforms/Individual/Credit/306%20and%20Inst.pdf>

\_\_\_\_\_ (2010c) Combined Report on Corporate Tax Preferences and the Major Business Facility Job Tax Credit (TY2008). Sept 28.

[http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD2082010/\\$file/RD208.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD2082010/$file/RD208.pdf)

\_\_\_\_\_ (2010d) Virginia Tax Facts. Jul. <http://www.tax.virginia.gov/Documents/TaxFacts.pdf>

\_\_\_\_\_ (2011a) Combined Report on Corporate Tax Preferences and the Major Business Facility Job Tax Credit (TY2009). Sept 29.

[http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD2382011/\\$file/RD238.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD2382011/$file/RD238.pdf)

\_\_\_\_\_ (2011b) Annual Report Fiscal Year 2010. Apr 25.

[http://www.tax.virginia.gov/Documents/AnnualReportFY2010\\_04252011.pdf](http://www.tax.virginia.gov/Documents/AnnualReportFY2010_04252011.pdf)

Virginia Department of Transportation (VDOT) (2010a) About VDOT. Online:

[http://www.virginiadot.org/about\\_vdot/default.asp](http://www.virginiadot.org/about_vdot/default.asp) Accessed Dec 8.

\_\_\_\_\_ (2001) Report of the Virginia Department of Transportation on Weight Limits for Trucks Hauling Gravel, Sand, or Crushed Stone in Certain Southwest Virginia Counties.

[http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/HD182001/\\$file/HD18\\_2001.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/HD182001/$file/HD18_2001.pdf)

\_\_\_\_\_ (2009a) VDOT Annual Budget Fiscal Year 2008-2009, Revised February 2009.

[http://www.virginiadot.org/projects/resources/FY09\\_Annual-Budget-Revised-Feb09.pdf](http://www.virginiadot.org/projects/resources/FY09_Annual-Budget-Revised-Feb09.pdf)

\_\_\_\_\_ (2009b) VDOT Financial Report, June 30, 2009.

[http://www.virginiadot.org/projects/resources/2009\\_FS.pdf](http://www.virginiadot.org/projects/resources/2009_FS.pdf)

\_\_\_\_\_ (2009c) Traffic Data Publications, 2008. Table 2230-D: Table Daily Vehicle Miles Traveled (DVMT) by Maintenance Jurisdiction by Federal Functional Class by FHWA Vehicle Class. Jul.

[http://www.virginiadot.org/info/2008\\_traffic\\_data\\_daily\\_vehicle\\_miles\\_traveled.asp](http://www.virginiadot.org/info/2008_traffic_data_daily_vehicle_miles_traveled.asp)

\_\_\_\_\_ (2009d) Virginia Department of Transportation Expenditures by City/County by Type for Period Ending June 30, 2009: Report 1 of 3. Jun.

<http://www.virginiadot.org/projects/resources/FourthQuarterFiscalYear2009.pdf>

- \_\_\_\_\_ (2010b) Mission, Shared Values and Code of Ethics. Online: <http://www.virginiadot.org/about/missionandvalues.asp> Accessed Dec 8.
- \_\_\_\_\_ (2010c) Traffic Data Publications, 2009. Table 2230-D: Table Daily Vehicle Miles Traveled (DVMT) by Maintenance Jurisdiction by Federal Functional Class by FHWA Vehicle Class. Nov. [http://www.virginiadot.org/info/2009\\_traffic\\_data\\_daily\\_vehicle\\_miles\\_traveled.asp](http://www.virginiadot.org/info/2009_traffic_data_daily_vehicle_miles_traveled.asp)
- \_\_\_\_\_ (2010d) State of the Pavement 2009. Feb. [http://www.virginiadot.org/info/resources/2Main\\_Report\\_ofStateofPav2009.pdf](http://www.virginiadot.org/info/resources/2Main_Report_ofStateofPav2009.pdf)
- Virginia Division of Legislative Services (VDLS) (2010a) A Legislator's Guide to Taxation in Virginia. Volume 1: State Taxes. <http://dls.virginia.gov/pubs/TaxVol1.pdf>
- \_\_\_\_\_ (2010b). About DLS. Accessed Sep 30. <http://dls.state.va.us/WELCOME.HTM>
- \_\_\_\_\_ (2010c). Telephone conversation DLS Staff Attorney Ellen Porter and author Hartz. Oct 6 2010.
- Virginia Retirement System (2011) 2011 investment highlights. Dec 1. <http://www.varetire.org/Pdf/Publications/2011-investment-highlights.pdf>
- Virginia Secretary of Finance (2010) Agency Information: Department of Taxation. Accessed Oct 3. <http://www.finance.virginia.gov/AgencyInfo/>
- Virginia Workforce Connection (VWC) (2010) Labor Market Data: Labor Force Data. Labor Force Employment and Unemployment. Query: every county in Virginia, Annual, 2008. <http://www.vawc.virginia.gov/analyzer/default.asp> Accessed Nov 18.
- Weldon Cooper Center for Public Services (2008) Virginia Local Tax Rates. 27<sup>th</sup> Annual Edition. <http://www.coopercenter.org/sites/default/files/econ/TaxRates/taxrates2009/2009TaxRatesBook.pdf>
- West Virginia Division of Highways (WVDOH) (2002) Coal Transport in West Virginia. Jan 21.
- White House (2010) White House Summit on Community College Fact Sheet. Accessed Jan 18, 2011. <http://www.whitehouse.gov/sites/default/files/uploads/White-House-Summit-on-Community-Colleges-Fact-Sheet-100510.pdf>
- Williams, Roger (2011) Abandoned Mine Land Services Manager, Virginia Department of Mines, Minerals and Energy. Information on historical Abandoned Mine Land Fund distributions to Virginia through September 30, 2009. Email correspondence with author McIlmoil. Nov 14.
- Zipper, Carl (1999) Powell River Project. Online: <http://www.cses.vt.edu/PRP/Overview.html> Accessed Dec 7.