

**VIRGINIA CENTER FOR COAL
AND ENERGY RESEARCH**

**EFFECTS OF VIRGINIA
COALFIELD
EMPLOYMENT
ENHANCEMENT TAX
CREDIT LEGISLATION**

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Virginia Coalfield Employment Enhancement
Tax Credit Legislation**

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Table of Contents

Executive Summary	1
Introduction	4
Tax Credit Legislation	4
Background	4
Current Legislation	5
Proposed Alternatives to the Current Legislation	6
Study Purpose	6
Study Methods	7
Findings	8
Background Information	8
Coal Producer Survey	11
Effects of the Current Tax Credit	23
Statewide Effects of Non-Delayed, Non-Contingent Tax Credits	23
Effects of Tax Credits on Export Coal Businesses at Hampton Roads	30
Summary and Conclusions	32
Acknowledgements	34
References	34
Appendices	35
A. Virginia Coalfield Enhancement Tax Credit Legislation	37
B. Economic Impacts of Coal	39
C. Coal Producers Survey Information Request	40
D. Coal Transport Impacts Assumptions	41
E. Hampton Roads Area Economic Multipliers	42
F. Economic Impact Projection Estimates	45

List of Tables

Table 1. 1993 Production, 1992 Reserves, and Reserves/Production Ratios (R/P). Top 15 U.S. Coal-Producing States	9
Table 2. Average Coal Mining Productivity (tons/labor hour): Central Appalachian States and Appalachia	10
Table 3. Virginia Overseas Exports, Hampton Roads Coal Exports, and World Seaborne Coal Trade, 1989 - 1994	11
Table 4. Non-Delayed, Non-Contingent Tax Credit Levels Considered By This Study (\$/ton)	17
Table 5. Estimated Cost of Current Tax Credit to State Treasury	23
Table 6. Estimated In-State Economic Benefits of Virginia Coal Production: 1993 Total, 1995 Total, and Incremental Effects of Non-Delayed, Non-Contingent Tax Credits	26

List of Figures

Figure 1. 1994 Unemployment in Virginia's Seven Coal-Producing Counties: Percent Unemployment, and Ranks Among 136 Jurisdictions	5
Figure 2. Effect of Tax Credits on Coal Production, as Projected by Mining Firms	13
Figure 3. Effect of Tax Credits on Surface-Mine Coal Production, as Projected by Mining Firms	14
Figure 4. Effect of Tax Credits on Deep-Mine Coal Production, as Projected by Mining Firms	14
Figure 5. Effect of Tax Credits on Coal Production for North American Metallurgical Markets, as Projected by Mining Firms	15
Figure 6. Effect of Tax Credits on Coal Production for North American Steam Markets, as Projected by Mining Firms	15
Figure 7. Effect of Tax Credits on Overseas Coal Exports, as Projected by Mining Firms	16
Figure 8. Open Investment Decisions Discussed by Mining Firms, in Addition to Tax Credit Effects	19

Figure 9. Aggregated Coal Price Expectations (Metallurgical, Steam, and Combined Market) of Coal Producers, Compared to an Annual Inflation Rate of Three Percent	20
Figure 10. Total Virginia Coal Production: 1990 - 1994, and Projected Levels (with and without Tax Credits)	22
Figure 11. Virginia-Produced Coal Exports: 1990 - 1994, and Projected Levels (with and without Tax Credits)	22
Figure 12. Projected Coal-Production Benefits of Tax Credits (Estimated Incremental Coal Production Due to Non-Delayed, Non-Contingent Tax Credits)	24
Figure 13. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State Employment	25
Figure 14. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on Statewide Payroll Income	25
Figure 15. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Current Level	28
Figure 16. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Double Current Level	28
Figure 17. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Triple Current Level	29
Figure 18. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - New Revenues as Percent of Gross Outlay	29
Figure 19. Projected Net Outlays Due to Non-Delayed, Non-Contingent Tax Credits	30
Figure 20. Projected Impacts of Tax Credits on Employment Supported by Virginia-Mined Coal at Hampton Roads, Compared to No Tax Credit	32

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Executive Summary

Study Context and Purpose

Coal mining is the major industry in Virginia's far southwestern counties. Coal transportation supports employment in other parts of the state. In 1995, the Virginia General Assembly passed, and the Governor signed, legislation establishing the Virginia Coalfield Employment Enhancement Tax Credit. This tax credit applies to coal produced from mines located within the state's borders. The tax credit is intended as a means of maintaining coal-related employment in the coalfield counties and other parts of the state. The Virginia Coal and Energy Commission is considering proposals that would modify the current tax credit.

The current legislation establishes a production tax credit of \$0.25 per ton for surface-mined coal, \$0.60 for coal produced in deep mines with seam thicknesses under 33 inches, and \$0.50 per ton for other deep-mined coal. The current tax credit will be available to coal producers with a three-year delay, and only if the state runs a revenue surplus which exceeds projections during the intervening fiscal year. The Coal and Energy Commission has voted to recommend removal of the revenue surplus contingency and three-year-delay provisions from the current legislation.

This report contains results of a study of the Coalfield Employment Enhancement Tax Credit's effect on export coal businesses at the Port of Hampton Roads. The study addresses this topic within the context of the tax credit's effect on the state as a whole. The study also addresses the effects of alternative tax credits under consideration by the Coal and Energy Commission.

Study Methods

The study addresses four separate production tax-credit alternatives: the current tax credit; and non-delayed, non-contingent credits at the current level, double the current level, and triple the current level.

The study was conducted by obtaining coal-production projections from Virginia coal-mining firms, and by using an economic impact model to estimate economic effects of projected tax-credit-induced production changes. Economic impact estimates consider the direct, indirect, and induced effects of in-state coal production and coal-transportation activity. We relied upon the Virginia coal industry to supply information on the tax credits' effect on coal production because current production and investment plans of mining firms will have a major impact on future production; within the short time frame and limited resources available for conducting this study, no other approach appeared feasible.

Tax-credit effects on coal export businesses at the Port of Hampton Roads were estimated based on additional Port tonnages likely to be generated by the tax credit. If a tax credit were to cause Virginia producers to increase Port tonnages by displacing tonnages currently shipped through the Port by out-of-state producers, no net benefit to the Port would occur. Projected economic effects are attributed to the tax credit only where tonnages handled by the Port are expected to increase as a direct result of the tax credit. Tax credit effects on in-state rail transport are estimated similarly.

Projected effects are estimates, not precise quantities. Study results do not consider potential resumption of activity at the Westmoreland Coal facility in Wise County which ceased operations earlier this year.

Findings: Current Market Trends

Data obtained from Virginia coal-industry sources indicate that a substantial decline in Virginia coal production is likely to occur over the next decade if current market trends continue. Without an increased tax credit or some other major market change, the cumulative industry expectation is a decline in Virginia coal production from 38.8 million tons in 1994 to approximately 32 million tons in the year 2000, 30 percent below 1990's record level. Such a production decline would correspond to a loss of about 5000 jobs (15 percent) from estimated 1994 statewide levels; this figure would include a loss of approximately 50 jobs (4 percent) from estimated 1994 levels in coal-related businesses at the Port. While these estimates do not consider potential resumption of activity at the Westmoreland facility, several other firms were unable to state with certainty that operations will continue throughout the forecast period.

Representatives of Virginia coal-mining firms attribute projected production declines to high mining costs caused by Virginia's difficult mining conditions. This projection of declining Virginia production is consistent with expectations of parties engaged in Appalachian coal businesses that do not operate Virginia mines. U.S. Department of Energy data show that reserves are depleted to a greater extent, and average mine labor productivity is lower, in Virginia than in neighboring coal-mining states. Reserve depletion could be expected to cause, and low mining productivity to result from, difficult mining conditions.

Findings: Projected Effects of Current Tax Credit

Without the tax credits, Virginia coal production is expected to decline to about 32 million tons by the year 2000. The current tax credit is expected to have little, if any, impact on this production decline. Virginia coal producer projections, compiled during this study, indicate that the current tax credit will cost the state between 12 and 15 million dollars annually between from 1999 through 2005. Such a tax credit is expected to provide some benefit. However, coal producers were unable to provide information that would enable those benefits to be quantified. The three-year delay and revenue-surplus contingency conditions were cited as factors which prevent the current tax credit from having a quantifiable influence on mine-planning and coal-marketing decisions. Benefits of the current credit are expected to be relatively minor in magnitude, compared to the benefits likely to result from a non-delayed, non-contingent tax credit.

Findings: Projected Effects of Non-Delayed, Non-Contingent Tax Credits

A production tax credit would have a greater effect if the three-year delay and revenue-surplus contingency clauses were removed from the legislation. A non-delayed, non-contingent tax credit at the current level would be expected to have a modest beneficial effect on coal production, while a non-delayed, non-contingent tax credit at double current levels would be expected to retain production at levels comparable to the projected 1995 figure through the year 2000. If such a tax credit were administered at triple current levels, modest production increases from 1995 forecast levels would be expected through the year 2000. For all three non-delayed, non-contingent credits: costs to the state would be greatest in 1996 and 1997 while benefits would be greatest in subsequent years.

If a non-delayed, non-contingent tax credit were established at the current credit level (\$0.25 per ton for surface mine coal, \$0.60 per ton for deep-mine coal from seams less than 33 inches in thickness, \$0.50 per ton for other deep-mine coal), it would help to assure that mining firms' current coal-production and mine employment projections are attained. Coal producers also expect such a credit would result in several hundred thousand tons of additional coal production annually.

A non-delayed, non-contingent tax credit at the current level would cost between 13 and 15 million dollars annually in foregone tax revenues. The foregone revenue estimate considers the state and local taxes that would be generated by coal production induced by the tax credit (production over and above current expectations, "incremental coal production"), and the cumulative per-ton costs of the credit ("gross costs") that would be incurred by the state treasury. Such a credit would help to retain jobs mining and transporting Virginia coal. Such a credit would also generate several hundred additional jobs, statewide.

If non-delayed, non-contingent production tax credits were available at double current levels, production would be expected to remain at levels close to 37 million tons annually through the year 2000, only slightly below the 38.8 million tons produced in 1994. Such a credit would cost the state approximately 27 million dollars in foregone tax revenues in 1996; this annual foregone-revenue cost would decline to approximately 15 million dollars by the year 2000. Foregone tax revenues would average 20 million dollars annually over the 1996 - 2000 period. Benefits resulting from such a credit would include an average of 2000 additional jobs, statewide, over the 1996 - 2000 period. Near the turn of the century, such a tax credit would generate close to 3000 additional jobs, statewide.

If non-delayed, non-contingent production tax credits were available at triple current levels, annual production levels of 38 to 39 million tons could be expected over the 1998 - 2000 period; these levels compare favorably to 1994's 38.8 million ton production. Such a tax credit would cost the state an average of \$32 million per year in foregone tax revenues while generating an average of 3000 additional jobs over the 1998 - 2000 period, including over 4000 near the end of this period.

Projections through the year 2000 are considered to be more reliable than projections beyond the year 2000. Data provided to this study indicate that, without the tax credit, production is expected to decline beyond the year 2000 at a rate consistent with apparent longer term trends; tax credits are expected to reduce the rate of production decline.

Projected effects of the tax-credit beyond the year 2000 may underestimate actual effects because this period lies beyond the realm of reasonable planning; therefore, it is difficult to state what effects a tax credit might or might not have. Because the tax credits as proposed will not be indexed to inflation, both their gross cost to the state and their effectiveness are likely to decrease with time.

Findings: Projected Effects on Coal-Export Businesses at the Port of Hampton Roads

The current production tax credit is not expected to have a substantive impact, either positive or negative, on employment at the Port. It is possible that the current tax credit could result in a small number of additional jobs at the Port, but information obtained during this study does not allow any such effect to be quantified. The current tax credit would be very unlikely to have any negative impact on employment in coal-related businesses at the Port.

A non-delayed, non-contingent production tax credit is expected to have a positive impact on employment in coal-related businesses at the Port. A non-delayed, non-contingent tax credit at the current level (\$0.25 per ton for surface mine coal, \$0.60 per ton for deep-mine coal from seams less than 33 inches in thickness, \$0.50 per ton for other deep-mine coal) would be likely to produce 5 to 10 additional jobs in coal-export businesses at the Port through the year 2000. A non-delayed, non-contingent tax credit administered at double the current level would be expected to produce 30 to 45 additional jobs in coal-export businesses at the Port over the 1998-2000 period, while such a tax credit administered at triple the current level would be expected to produce 80 to 100 additional jobs at the Port over the same period.

A non-delayed, non-contingent coal-production tax credit would be unlikely to have any negative effects on employment in coal-export businesses at the Port.

Introduction

Coal mining is the major industry in Virginia's far southwestern counties. Transportation of coal supports employment in other parts of the state. Coal has a substantial economic impact on communities near the Port of Hampton Roads, one of the world's leading coal-shipping terminals. A substantial portion of the coal moving through the Port of Hampton Roads originates in Virginia mines.

In 1995, the Virginia General Assembly passed, and the Governor signed, legislation establishing the Virginia Coalfield Employment Enhancement Tax Credit. This legislation established a tax credit for coal produced from mines located within the state's borders. The legislation also called for studies of the tax credit's economic effects. The Virginia Port Authority is called upon to undertake a study of the tax credit's effect "on the export coal businesses at the Port of Hampton Roads," while the University of Virginia's Center for Public Service was directed to undertake a study of tax credits' "policy, legal, and economic impacts." The Center for Public Service was directed to conduct its study in cooperation with several other agencies, including the Virginia Port Authority. The full legislation is reproduced as Appendix A.

During the months following the legislation's enactment, additional consideration has been given to the coal tax credits by the Coal and Energy Commission of the General Assembly. This study addresses economic impacts of the current legislation, and of several proposed modifications to that legislation that are currently under discussion by the Coal and Energy Commission.

Tax Credit Legislation

Background

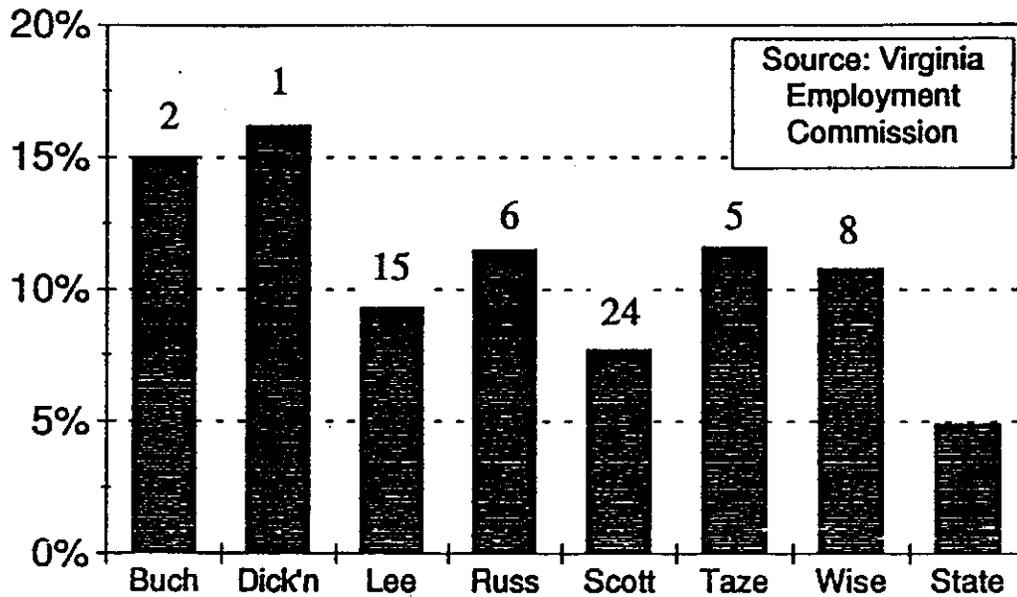
Coal has been mined commercially in Virginia since the 1880s. Virginia's rich coal reserves made this Commonwealth the nation's seventh-largest coal producing state during the early 1990s, despite the fact that Virginia's coal production takes place within a relatively small geographic area. However, a long history of intense mining has taken its toll; reserve depletion has become a major concern of the state's coal industry.

Coal exports from Virginia mines have been declining steadily throughout the early 1990s. The economic impacts of this decline were the subject of previous study directed by a Resolution of the General Assembly. In 1993, Senate Joint Resolution 208 called for the preparation of an export plan for Virginia coal. A portion of the resultant document (VDED, 1994) prepared by VCCER described factors affecting Virginia producers' competitive position in global coal markets.

Due to the continuing decline in Virginia's coal exports and other factors, a number of mine closings occurred during 1994. Virginia's 1994 coal production declined to 38.8 million tons (Virginia Department of Mines, Minerals and Energy - VDMME), 20 percent below 1990's 46.5 million-ton record production level; the coal-producing counties were among the state's unemployment leaders (Figure 1). Both VDMME and Virginia Employment Commission figures show Virginia mine employment declining to less than 8500 jobs in 1994, a loss of approximately 800 jobs compared to 1993 levels.

Over the longer term, coal employment declines have been more dramatic. Approximately 20 percent of the jobs supported by Virginia's mines in 1990 had been lost by 1994. In the early 1980s, Virginia mine employment ranged from 14,000 to 15,000; by 1994, these levels had been cut by more than 40 percent.

**Figure 1. 1994 Unemployment in Virginia's Seven Coal-Producing Counties:
Percent Unemployment, and Ranks Among 136 Virginia Jurisdictions**



A number of mines were closed during 1994, including several which produce primarily for overseas markets. During early 1995, one of Wise County's major coal producers (Westmoreland Coal) ceased operations. In subsequent months, Wise County's unemployment rate was the highest in the state. High mining costs, a result of reserve depletion and unfavorable geologic conditions, are cited by Virginia coal producers as the primary reason for the state's declining coal production. A study sponsored by Virginia Coal Association documented coal operators' high mining costs (EVA, 1994).

Current Legislation

The Virginia Coalfield Employment Enhancement Tax Credit was proposed as a response to deteriorating economic conditions in southwestern Virginia's coal-mining counties, and associated concerns regarding declining coal-transportation impacts on employment in other parts of the state. The legislation renewed tax credits for in-state utilities using Virginia coal, and it increased the tax credits currently received by in-state steam producers to the same level as that received by utilities. The legislation also established a tax credit to be received by coal producers. That tax credit is the focus of this study.

Beginning on January 1, 1996, production tax credits are available to producers of coal from Virginia mines at several different levels:

- \$0.25 per ton for surface-mined coal;
- \$0.50 per ton for coal produced in underground mines where seam thickness is 33 inches and above; and
- \$0.60 per ton for coal produced in underground mines where seam thickness is under 33 inches.

According to the legislation, "seam thickness shall be based on the weighted isopach mapping of actual coal thickness by mine as certified by a professional engineer." Coal-producing firms will be eligible to apply for tax credits three years after the coal is mined; thus, firms mining coal in 1996 will be able to

apply to receive those credits in 1999. However, no credit will be received by coal producers unless the State's general fund revenue during the intervening fiscal year "exceeds the official estimate of general fund revenue by at least the cost of the credits authorized ..." Production tax credits are not available for coal sold to purchasers claiming the utility or the steam-producer tax credit. The tax credits are transferable.

Proposed Alternatives to the Current Legislation

The production tax credit enacted in 1995 differs in amount and availability from that which was originally proposed. On June 20, 1995, the Coal Subcommittee of the Coal and Energy Commission voted to recommend that the three-year delay and the revenue-surplus contingency clauses be removed from the tax-credit statute. On that date, the Coal Subcommittee also requested that VCCER study the economic effects of non-delayed, non-contingent tax credits at three separate levels: a level consistent with the current tax credit, and levels equal to double and triple the current level. This request was communicated to the Virginia Port Authority by VCCER shortly after June 20; VCCER requested that the Subcommittee or its staff formally notify the Port Authority of this request. On August 29, the full Commission voted to recommend removal of the three-year delay and revenue surplus contingency clauses from the legislation.¹

In the text which follows, the tax credit authorized by the current legislation will be referred to as the "current tax credit." Tax credits which might be enacted through a modification of the current legislation via removal of the three-year delay and revenue surplus contingency clauses will be referred to as "current level," "double current level," and "triple current level" tax credits.

Study Purpose

This report contains results of a study of the Coalfield Employment Enhancement Tax Credit's effect on export coal businesses at the Port of Hampton Roads. The study addresses this topic within the context of the Tax Credit's effect on the state as a whole.

The study also addresses the effects of tax credits at the current level, double the current level, and triple the current level if the three-year delay and revenue surplus contingency clauses were to be removed from the statute.

This study is being conducted in response to the Coalfield Employment Enhancement Tax Credit legislation and the request of the Coal and Energy Commission's Coal Subcommittee. Results will be provided to the Virginia Port Authority and the Center for Public Service, for use by those organizations in responding to the legislation's requirements. Results will also be provided to the Coal and Energy Commission through its Coal Subcommittee.

1. On November 9, 1995, the Coal and Energy Commission voted to recommend to the General Assembly an increase in the amount of the tax credit to 30 million dollars per year, an amount consistent with the "double-current-level" credit discussed in this study.

Study Methods

The study has taken place in three major phases. These procedures were carried out between June 15 and September 15, 1995.

1. *Develop background information on factors affecting Virginia coal production and overseas export sales.*

Major sources of information accessed in conducting this portion of the study include the following:

- Persons with knowledge of U.S. coal export markets, including employees of businesses dealing with coal exports.
- Previous studies and available literature. We were especially interested in studies which attempted to model world metallurgical coal market responses to various factors, including changes in market price.
- Historical data on Virginia coal production, coal exports to overseas markets from Virginia mines, and coal export shipments through the Port of Hampton Roads.

2. *Estimate the effect of tax credits on Virginia coal production and market sales.*

This portion of the study was conducted through a survey of Virginia coal producers. Representatives of thirteen Virginia coal-producing firms provided information on the likely impacts of various tax credits on their future production, operations, and sales.

The current plans and expectations of major coal-producing firms will have a major effect on future production levels. Several supplements and/or alternatives to the producer survey approach of projecting future production were considered during the early stages of this study, but all were rejected as infeasible.

Analysis based upon an econometric modeling approach was rejected based on several factors:

- The small number of firms operating in Virginia would make it difficult to develop a statistically valid modeling approach.
- The paucity of information available on market prices would hinder efforts to model the price/market- volume relationships that would be critical to such an analysis.
- A high proportion of Virginia's coal is sold in metallurgical markets, where coal quality is an essential consideration (*i.e.*, high-quality metallurgical coals cannot be considered as a bulk commodity).
- Reserve depletion is expected to have a major influence on production from Virginia mines. The effects of future reserve depletion cannot be modeled through analysis of historical data.

An analysis based on comparison of Virginia producers' mine-cost supply curves to those of Virginia's major competitors was also judged to be infeasible due to lack of immediately available information and a limited time frame.

Our literature search yielded no comparable studies using methods that could be applied to the current study as a supplement or alternative to the producer-survey approach.

3. *Determine economic impacts of projected changes in coal production and market sales caused by tax credits.*

The statewide economic impacts of tax-credit-induced coal production and market sales changes were estimated using a framework similar to that of two prior VCCER studies: our initial effort to estimate the coal industry's economic impact (Zipper *et al.*, 1992), and a more recent study which was completed in late 1994 (Zipper, 1995; hereafter referenced as VCCER 95-1).

Both mining and transportation-related economic impacts were considered. *Direct* impacts include employment, payroll expenditures, and tax payments by the industry or economic segment in question. *Indirect and induced* impacts are estimated through the use of economic multipliers derived from input-output models. Because the two previous VCCER studies discussed estimating methods in significant detail, this report will not repeat those details; the estimating methods used here will only provide detail where the current method differs from that of VCCER 95-1. Additional information on economic impacts considered is contained in Appendix B.

The current study estimates of coal-related economic impacts at the Port of Hampton Roads are based on a report prepared by Gil Yochum and Vinod Agarwal, of Old Dominion University, for use in this study (Appendix E). Drs. Yochum and Agarwal have conducted four studies of the Port's economic impacts; the most recent was completed in 1992 (Yochum and Agarwal, 1992).

The current study focuses on the economic impacts of the tax credits. These impacts are estimated based on a *with vs. without* approach: For each tax credit considered, the projected economic impact of coal with the credit in place is compared to the impact of coal without the credit so as to determine the impact of the credit itself. For each tax credit considered, this procedure is carried out for both the state as a whole and for coal-related businesses at the Port.

Findings

Background Information

Coal Production

Crabtree and Topuz (1995) used a mathematical model to forecast Virginia coal production through the year 2010. A wide variety of data variables were identified as being closely related to coal production. Of these, six were selected for use in a coal-production model. These six variables were [price*productivity], coal reserves, U.S. electricity consumption, U.S. coal exports, U.S. industrial coal consumption, and cumulative production by several mining firms which participated in the study. The researchers derived a mathematical relationship between these six variables and coal production levels.

The Crabtree and Topuz model explained 87 percent of the variation in production levels over the 1979 - 1993 period. This model was used to forecast coal production through the year 2010. The results show production declining from 40 million tons in 1993 to approximately 37 million tons in the year 2000, and 34 million tons in 2005. The major company producers participating in Topuz and Crabtree's study (representing 83 percent of Virginia's total production) expected their production to decline by 16 percent over the 1993-2000 period, while the model result shows only a 10 percent decline. This result

**Table 1. 1993 Production, 1992 Reserves, and Reserves/
Production Ratios (R/P), Top 15 U.S. Coal-Producing States**

State	1993 Production Rank	1993 Production (million short tons)	1/1/92 Reserves (million short tons)	R/P (years)
Wyoming	1	210	42,637	203
Kentucky	2	156	14,370	92
West Virginia	3	131	20,097	154
Pennsylvania	4	60	12,700	213
Texas	5	55	10,212	187
Illinois	6	41	30,091	732
Virginia	7	39	1,487	38
Montana	8	36	75,508	2,102
North Dakota	9	32	7,316	229
Indiana	10	29	4,396	150
Ohio	11	29	11,794	409
New Mexico	12	28	2,496	88
Alabama	13	25	3,090	125
Colorado	14	22	10,163	464
Utah	15	22	3,066	140
Eastern Kentucky		72	4,991	70

Source: U.S. Department of Energy, EIA (1993a, 1993b).

demonstrates that Virginia producers expect coal production to decline at a faster rate than would be indicated solely by historical market patterns. Crabtree and Topuz carried out their producer survey in late 1993 and early 1994.

EVA (1994) projects Virginia coal production for the years 2000 and 2005, based on the cumulative expectations of the Virginia Coal Association (VCA) membership. In 1993, this production represented 80 percent of Virginia's total. The EVA/VCA forecast shows Virginia coal production declining to 31 million tons by the year 2000, and to 29 million tons by 2005. Coal producers prepared these production estimates during the summer and fall of 1994. The EVA study was based on Mine Safety and Health Administration production data; the MSHA data represent 1993 Virginia production at 38.6 million tons.

Virginia producers base their expectations of production decline on the fact that they suffer cost disadvantages relative to their competitors. According to the Virginia producers, reserve depletion in Virginia causes the state's mines to operate under difficult geologic conditions, which increases mining costs. U.S. Department of Energy data demonstrate that reserve depletion has progressed in Virginia to a greater extent than in other major coal-producing states (Table 1). The reserves/production ratios (R/P) in Table 1 are indicators of the ability of each state's reserves to sustain production at current levels; they should not be interpreted as "the number of years" that coal mines in a given state will operate.

**Table 2. Average Coal Mining Productivity (tons/labor hour):
Central Appalachian States and Appalachia**

	1990	1991	1992	1993
Surface Mines:				
Virginia	2.89	2.95	3.50	3.55
West Virginia	4.02	4.18	4.27	4.35
Eastern Kentucky	3.13	3.43	3.57	3.74
Appalachia	3.10	3.24	3.40	3.55
Deep Mines:				
Virginia	2.14	2.12	2.20	2.19
West Virginia	2.70	2.83	2.99	2.92
Eastern Kentucky	2.44	2.66	2.86	2.89
Appalachia	2.40	2.54	2.76	2.75

Source: U.S. Department of Energy, EIA (1993a).

Productivity data compiled by the U.S. Department of Energy support the assertion that Virginia producers suffer cost disadvantages relative to their domestic competitors (Table 2). These data show that Virginia's underground mines (75 percent of 1994 production) have lower productivity, on average, than their West Virginia and eastern Kentucky competitors (productivity figures specific to southern West Virginia are not available). The data also indicate that, over the 1990-1993 period, Virginia's underground mine productivity has increased very slowly, compared to the rates of increase in West Virginia and eastern Kentucky underground mines. Virginia producers state that poor geological conditions, resulting from reserve depletion and other factors, depress labor productivity in Virginia mines.

Virginia's surface mine productivity compares favorably to Appalachian averages. However, surface mine productivity in Virginia is well below the productivity levels of major competitors in West Virginia and eastern Kentucky. Labor typically accounts for a substantial portion of the cost of mining coal.

Virginia Coal Exports

Virginia coals are known worldwide for their excellent metallurgical properties. In recent years, however, the world metallurgical coal marketplace has become highly competitive (VDED, 1993). Virginia coal exports are predominantly metallurgical.

Between 1990 and 1994, Virginia's overseas' exports declined by 7 million tons, a factor of nearly 40 percent relative to 1990's record export level (Table 3). Total overseas coal shipments from the Port of Hampton Roads declined by a similar factor over this period. Several major factors account for declining coal export tonnages during the early 1990s, including changing currency evaluations and aggressive Australian competitors. Virginia's 35 percent share of the Hampton Roads' metallurgical exports in 1994 was only slightly below 1989-1993 average levels, while Hampton Roads' 1994 share of the world metallurgical market was well below 1989-1992 levels. Shipments from Virginia producers on the Norfolk Southern system through the Port were up only slightly (about 1 percent) during the first seven months of 1995, compared to 1994.

**Table 3. Virginia Overseas Exports, Hampton Roads Coal Exports,
and World Seaborne Coal Trade, 1989 - 1994**

	1989	1990	1991	1992	1993	1994
Coal Shipments (million short tons)						
Virginia Overseas Exports	13.7	17.9	16.7	15.9	13.0	10.9
Hampton Roads Export Shipments:						
Total	48.5	54.5	57.9	53.1	37.4	34.8
Metallurgical	41.1	44.5	46.4	43.3	33.4	31.5
World Seaborne Coal Trade:						
Total	364.1	388.0	409.8	408.7	403.3	N/A
Metallurgical	177.1	174.9	183.7	176.0	178.4	N/A
Market Shares						
Virginia vs. H.R. Met	33%	40%	36%	37%	39%	35%
H.R. Met vs. World Met ¹	23%	25%	25%	25%	19%	18%

1. Assuming 1994 world seaborne met trade at 180 million tons.
Sources: National Coal Association, U.S. Department of Energy.

Coal Producer Survey

Method

Representatives of Virginia coal-producing firms were interviewed during July and August, 1995. Thirteen firms that produce coal in Virginia were contacted, and all participated in the study.

The initial contact was made through a letter explaining the purpose of the study. Enclosures included a summary of the information being sought (Appendix C) and a copy of the tax credit legislation. The letter was followed by a telephone call. Information was obtained from participating firms through personal interviews at their places of business (10 firms) or through telephone discussion (3 firms). In most cases, follow-up phone calls were made to clarify details discussed during the primary contact.

Firms were asked to provide production and marketing information for 1994, and "future expectations." Discussions of future expectations focused on the years 2000 and 2005. Participating firms were assured that details regarding production plans of individual companies would not be published, discussed, or otherwise released.

Interpretation of survey results (Figures 2 through 8) should focus on multiple-year trends. Minor year-to-year variations are not meaningful. A typical statement by a company representative might be, "We anticipate that production from that facility will range from 500,000 to 600,000 tons per year, beginning in 1996 or 1997 and extending for 6-to-8 years." In compiling our figures, we would interpret such a statement by recording 275,000 tons of production for 1996, 550,000 tons per year for 1997 through 2002, and 275,000 tons in 2003.

Planning by the Virginia mining firms typically focuses on periods of 5 to 7 years. Thus, the figures which follow for the years 1996 through 2000 are, in most case, based upon economic planning by coal-mining firms. There are substantial differences among Virginia coal-mining firms in terms of the amount of effort that has been applied to planning for the 2001-2005 period. The data for the years 1995 - 2000 are more reliable. Tax-credit effects appear to decline beyond the year 2000; to some extent, this result may derive from company difficulties in forecasting beyond the 2000-2002 period. A substantial proportion of the credit-induced "new production" would occur due to favorable effects of tax credits on the economic returns required to justify new mines. Because detailed planning has not occurred, in most cases, for periods beyond the year 2000, post-year-2000 project proposals which might be influenced favorably by tax credits during the post-2000 period are not available.

Westmoreland Coal Company was among the participating firms. Westmoreland Coal has recently ceased operations at its Virginia facility. Because the future status of Westmoreland's Virginia operations is uncertain, the post-1995 figures which follow exclude potential production from the Westmoreland facility. Knowledgeable parties both within and outside of Westmoreland Coal anticipate that, at some point, production will resume; however, there are substantial differences of opinion regarding when production is likely to resume, and at what levels. At the time of this writing, no plans to resume production at this facility had been announced. None of the parties contacted felt comfortable projecting possible impacts of tax credits on production from those reserves leased by Westmoreland Coal.

In Figures 2 through 6, two separate data points are plotted for the years 1994 and 1995. The "Inc. Westmoreland" figure includes production from all 13 firms, while the other 1994-1995 data points represent production by the 12 currently active firms. Westmoreland shipped no export tonnages from its southwest Virginia facility in 1994 or 1995.

1994 Production

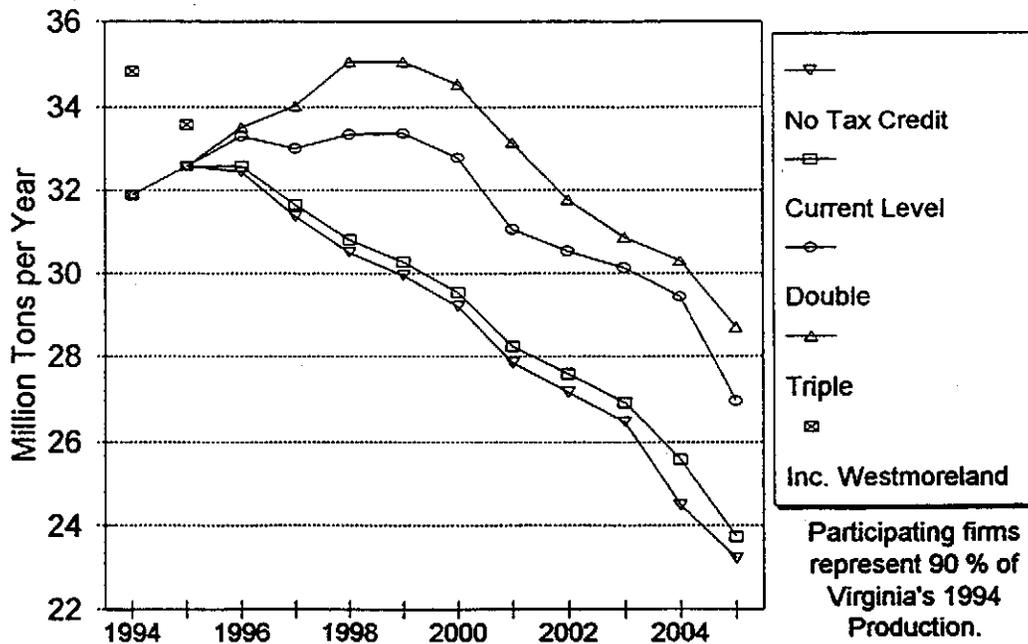
The cumulative 1994 Virginia production of the thirteen participating firms was 35 million tons, approximately 90 percent of Virginia's 38.8 million-ton total. These figures include production from company-owned mines, and of mining firms operating under contract to the participating firms. In some cases, the figures also include coal purchases by participating firms from non-contract producers. Excluding Westmoreland Coal, cumulative production was 31 million tons, approximately 80 percent of the state total.

Production and Market Sales Expectations Without Tax Credit

Study participants were asked to project their company's production over the next ten years, based on their assessment of current economic conditions (*i.e.*, without any new production tax credits and/or a major change in the current tax credit legislation). Given these circumstances, the cumulative expectation of participating firms is a production decline from the current 35 million-ton level (31 million tons, excluding Westmoreland) to approximately 29 million tons by the year 2000, and 23 million tons by the year 2005 (Figure 2).

There are some major differences among Virginia's producing firms, in terms of production expectations. While some firms anticipate that their Virginia facilities will cease operations without a major market change (such as a tax credit or an unanticipated coal-price increase), other firms anticipate maintaining current production levels, or increasing those levels, throughout the next decade.

Figure 2. Effect of Tax Credits on Coal Production, as Projected by Mining Firms



Producers expect surface mining to decline rapidly over the next 5 years due to depletion of surface reserves (Figure 3), while cumulative expectations for deep mining include a decline that is less rapid (Figure 4). Some producers plan to bring modest amounts of new capacity into production; this new production will partially offset production declines expected by other producers. Some of this new capacity is being brought into production by firms which need to increase volumes as a means of reducing the per-ton requirements of covering fixed-cost obligations.

Data on the producers' expectations of sales volumes to domestic markets (Figures 5 and 6) show North American steam sales decreasing sharply over the next five years, while domestic metallurgical sales decrease modestly and overseas export sales increase slightly (Figure 7). Overseas export sales are dominantly metallurgical; very little coal is moving from Virginia mines to European steam markets at present, and no major increases are expected. Over the six months prior to this study, the U.S. dollar had declined sharply in its valuation versus the Australian dollar; this currency move had a favorable impact on overseas export sales and expectations. While producers expect overseas export sales to increase modestly in 1995 and 1996, relative to 1994 levels, tonnages are expected to remain far below early-1990s levels.

Data representing cumulative expectations of particular industry segments cannot be used to derive an expectation for any individual company which may operate within that segment. Most of the 13 firms sell to several markets, and a number of firms operate both surface and deep mines. Within most segments, the levels of optimism represented by expectations of individual firms vary greatly.

Figure 3. Effect of Tax Credits on Surface-Mine Coal Production, as Projected by Mining Firms

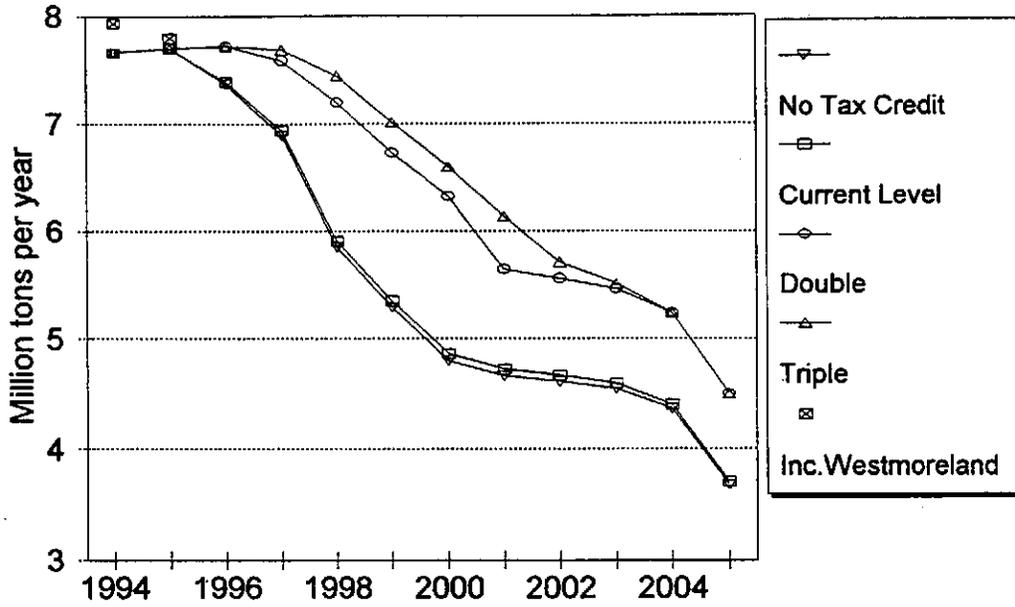


Figure 4. Effect of Tax Credits on Deep-Mine Coal Production, as Projected by Mining Firms

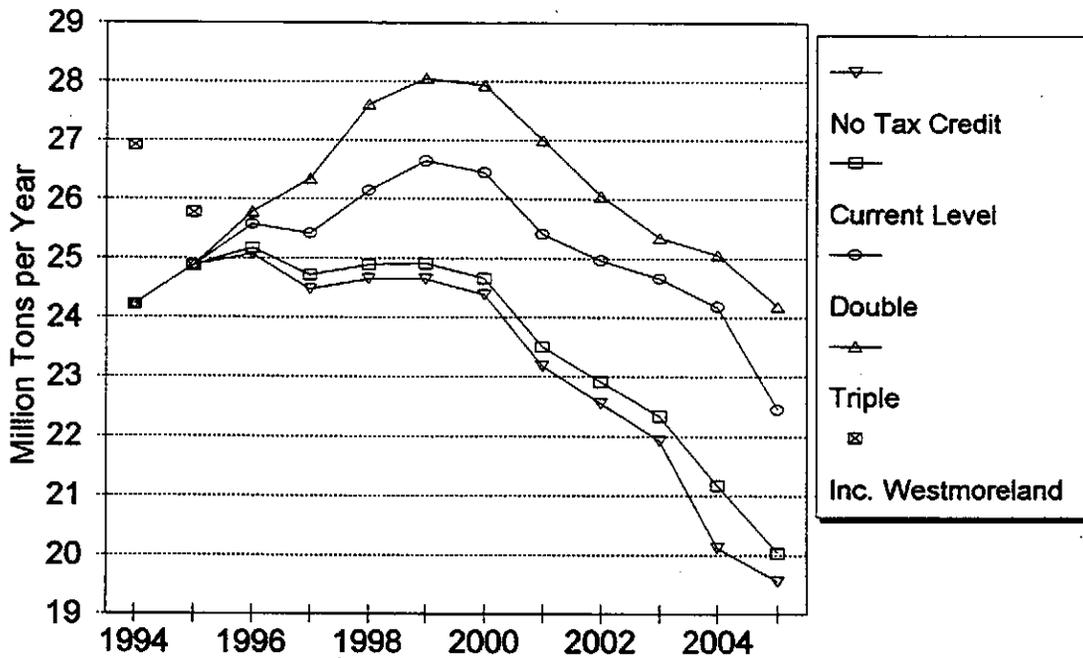


Figure 5. Effect of Tax Credits on Coal Production for North American Metallurgical Markets, as Projected by Mining Firms

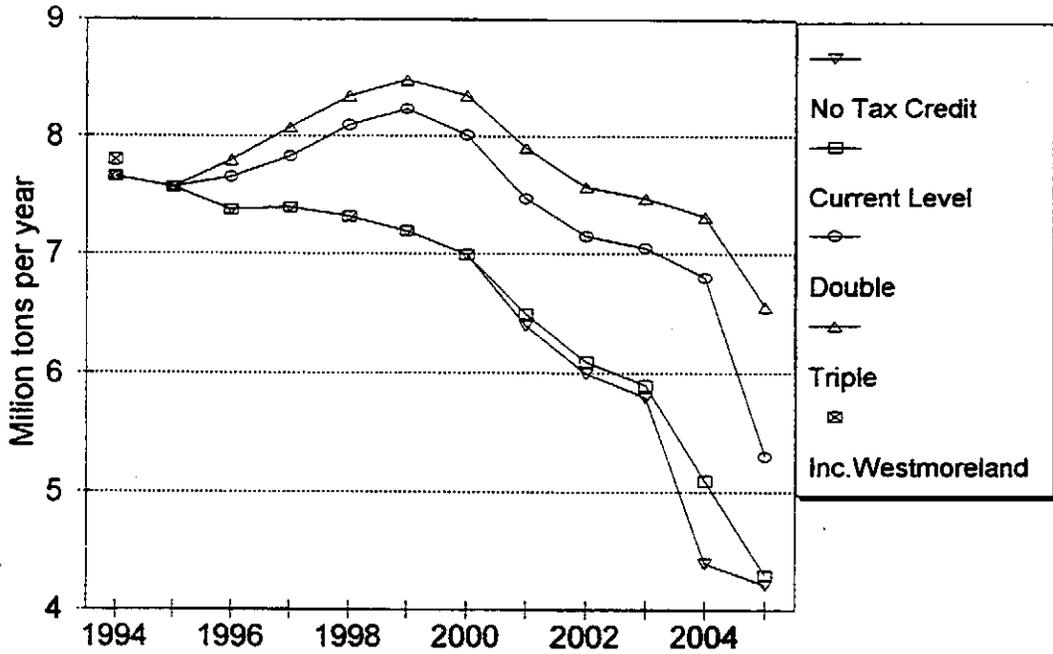


Figure 6. Effect of Tax Credits on Coal Production for North American Steam Markets, as Projected by Mining Firms

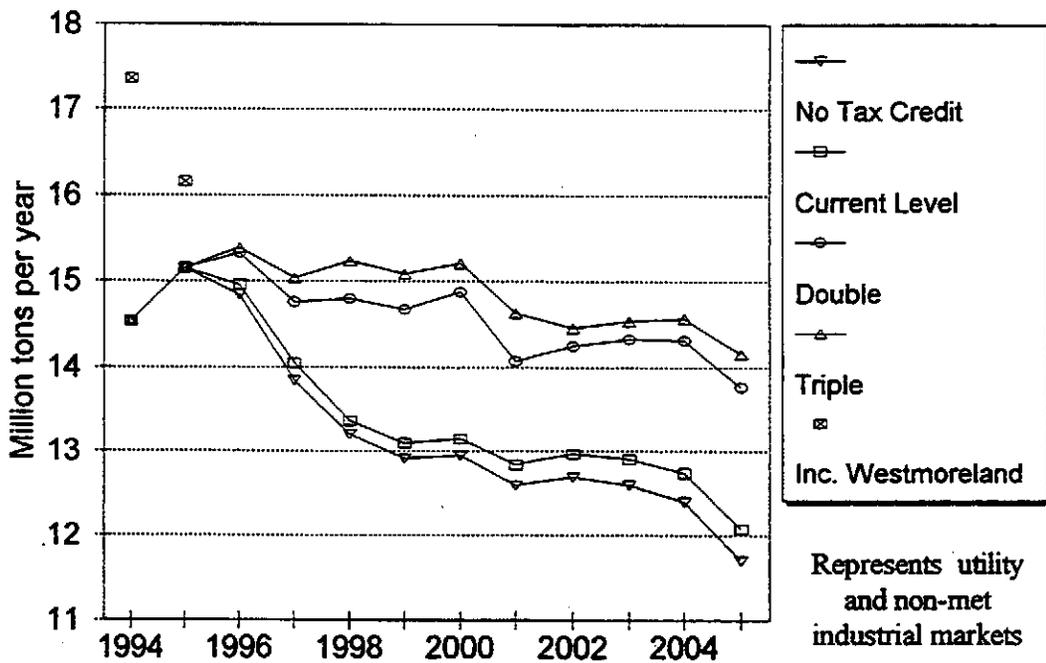
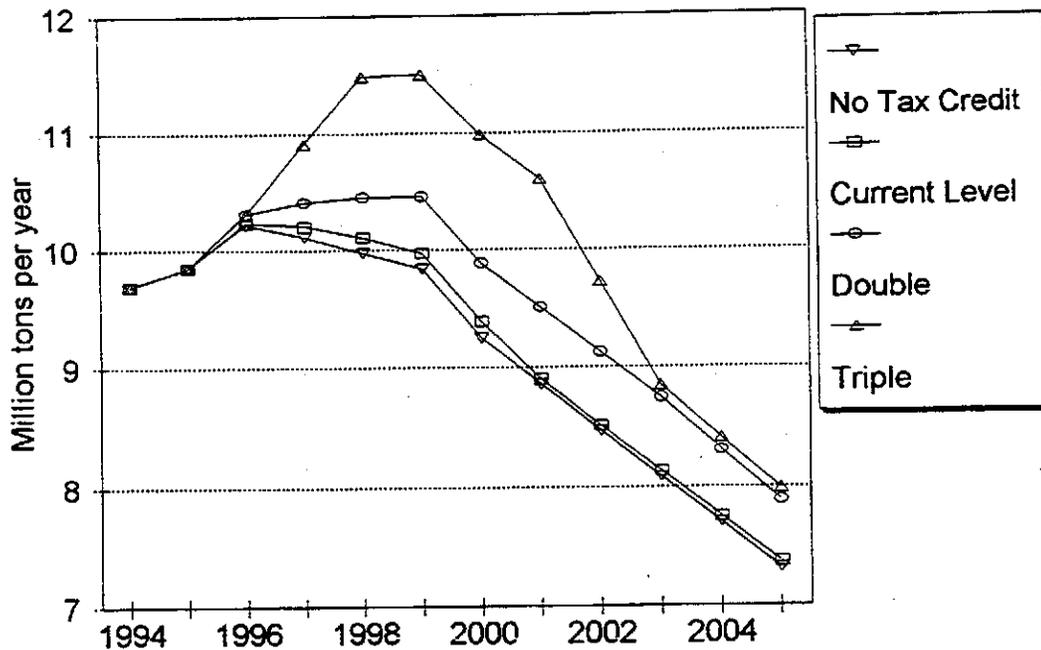


Figure 7. Effect of Tax Credits on Overseas Coal Exports, as Projected by Mining Firms



Effect of Current Tax Credit

All 12 producing companies indicated that the current tax credit has virtually no effect on their long-term production expectations or mine planning. The persons with whom we spoke were appreciative of the effort required to establish the current tax credit, and of the gesture of support for the coal industry which it represents. Several stated that, if it remains on the books in the current form, the current tax credit could have an impact on day-to-day decisions; most stated that it would provide a benefit to the industry. Thus, the current tax credit may assist in sustaining Virginia employment. However, none of the parties contacted were comfortable providing quantitative projections of the production increases which they would consider as likely to occur as a result of the current tax credit.

The primary reasons for the current credit's lack of quantifiable effect are (i) the three-year delay provision, and (ii) the contingency of the credit upon a state revenue surplus during the period between mining and the year in which the tax credit can be claimed. The three-year delay is troublesome for those companies whose financial condition is marginal; month-to-month cash flow was cited as a major concern by some companies. Under such circumstances, it is difficult to justify consideration of a tax credit which may or may not be received in three years as an influencing factor in business decisions. The revenue-surplus contingency was cited as a factor which would prevent publicly held firms from accounting tax credits as financial assets. Company representatives stated that neither coal supply nor investment decisions would be based on tax credits that they may or may not receive.

Table 4. Non-Delayed, Non-Contingent Tax Credit Levels Considered By This Study (\$/ton of coal produced)

Tax Credit	Surface Mining	Deep Mining (< 33 inches)	Other Deep Mining
Current-Level	\$0.25	\$0.60	\$0.50
Double Current-Level	\$0.50	\$1.20	\$1.00
Triple Current-Level	\$0.75	\$1.80	\$1.50

Effect of Tax Credits Without 3-Year Delay and Revenue Surplus Contingency

Current-Level

Company representatives were asked if a tax credit at the current level (Table 4) would have an effect on future coal production if it were available with no delay (*i.e.* the tax credit for coal mined in 1996 could be claimed in 1997) and without any contingency.

Company representatives stated that such a tax credit would be helpful, and that it would have an impact on day-to-day production decisions. However, representatives of only two of the 12 producing companies quantified expectations of production increases likely to result from such a tax credit.

Several parties stated that these amounts are too small to have a practical effect on planning. Investment decisions are based on the relationship between mining-cost and coal-price forecasts. These tax-credit amounts were described as being well within the range of unforeseeable variations in essential price and cost factors. For example, fifty-cent variations in coal prices and rail rates were described as being fairly common and difficult to predict. One party described the inability of a 50-cent tax credit to have a practical effect on planning in terms of the difficulty of forecasting mining costs within a five-percent accuracy (\$1-plus per ton) range. A mining-cost inflation projection that is off by ½ of one percent (annual) over a three-year period will be equivalent to about 40 cents per ton, close to the average value of this tax credit.

The above remarks notwithstanding, the parties stated that such a tax credit would have a positive effect. Several stated that the primary effect would be to increase the probability that they would be able to meet anticipated production targets over the next 10 years, *i.e.* it would help to ensure that they will be able to continue operations. Several parties stated that they would factor such a tax credit into investment decisions, but they were unable to project the effects of such a tax credit on annual production. Thus, the actual effects of such a credit may be understated by these results, which include only quantified expectations.

Double Current-Level

Most mining firm representatives believe that a non-delayed, non-contingent tax credit at double the current level would have an effect on production decisions. Parties representing eight of the 12 producing firms quantified expectations of production increases considered likely to result from such a credit. Tax credits at this level are expected to stimulate North American steam and metallurgical sales.

Triple Current Level

Most mining firm representatives believe that a non-delayed, non-contingent tax at triple the current level would have an effect on production decisions. Parties representing eight of the 12 producing firms quantified expectations of production increases considered likely to result from such a credit. Tax credits at this amount would be expected to have only a minor incremental effect on surface mining, compared to the double-current-level credit. However, these credits would be expected to have a significant stimulative effect on deep mining and on overseas export sales.

Other Tax-Credit Effects

Increases in production due to non-delayed, non-contingent tax credits are expected to result from two major factors: Increased extraction efficiency in existing mines, and new investment.

Increased Production from Current Mines

A number of producers expect production from existing mines would increase if tax credits are expanded. Such increases would result from mine operators' increased ability to fully extract these mines' reserves. The availability of tax credits would enable deep-mining operations to recover coal from thin-seam areas within operating mines, coals that would otherwise be unrecoverable (seam thicknesses can vary laterally due to geologic conditions). They would also allow mine operators to extend operations further from the mine entry.

Several deep-mine operators expect that tax credits would extend mine life by allowing reinvestment in mining equipment (*i.e.* better equipment maintenance; setting aside funds in an equipment-replacement reserve). That reinvestment cannot occur under the low current margins of some operations. Without that reinvestment, mines will close when the present equipment deteriorates. Surface mine operators expect that tax credits would allow expansion of stripping ratios on current mines.

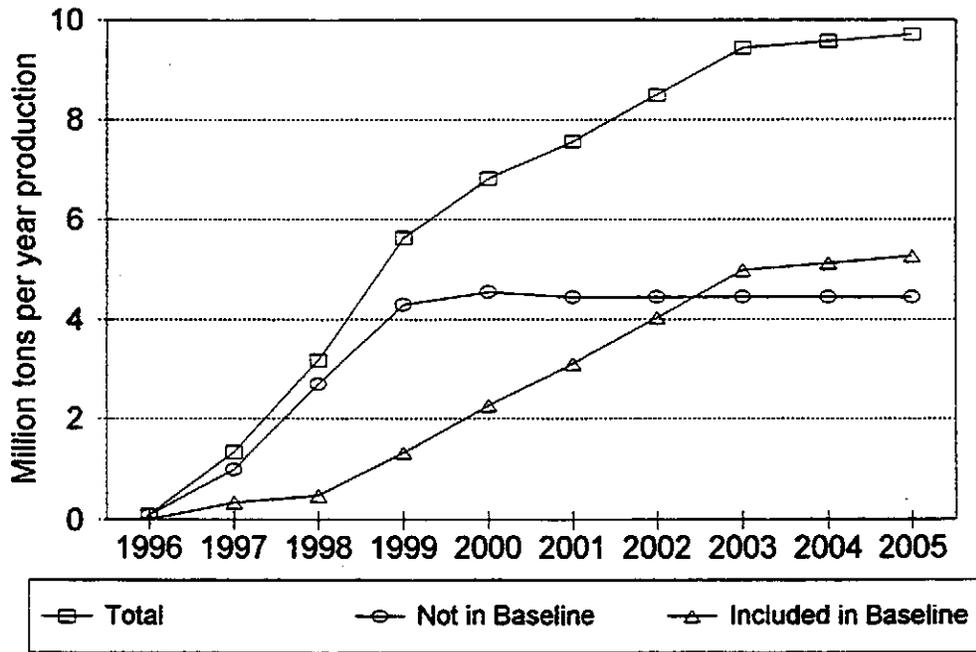
Increased production from existing mines would occur via more efficient and complete extraction of these mines' coal reserves. None of the parties contacted suggested that tax-credit-induced production increases would occur due to more rapid depletion of coal reserves from existing mines. Several stated that, although tax credits would be unlikely to cause major production increases during the 1996-2005 period, credits would allow them to extend mining in current reserves further beyond the year 2005.

New Investment

A portion of the projected tax-credit-induced production increases would result from investment in new mines and support facilities. Several potential investments were discussed which cannot be justified based on current market expectations, but which do come close to a positive evaluation. In some cases, the availability of a tax credit at double or triple current levels was discussed as sufficient to provide the positive margin necessary to justify a proposed investment. Production from additional capacity created by such investment is responsible for a portion of the expected tax-credit-induced production increments.

Several parties emphasized that coal tax credits must be viewed as stable, over the long term, in order to justify capital investment decisions.

Figure 8. Open Investment Decisions Discussed by Mining Firms, in Addition to Tax Credit Effects



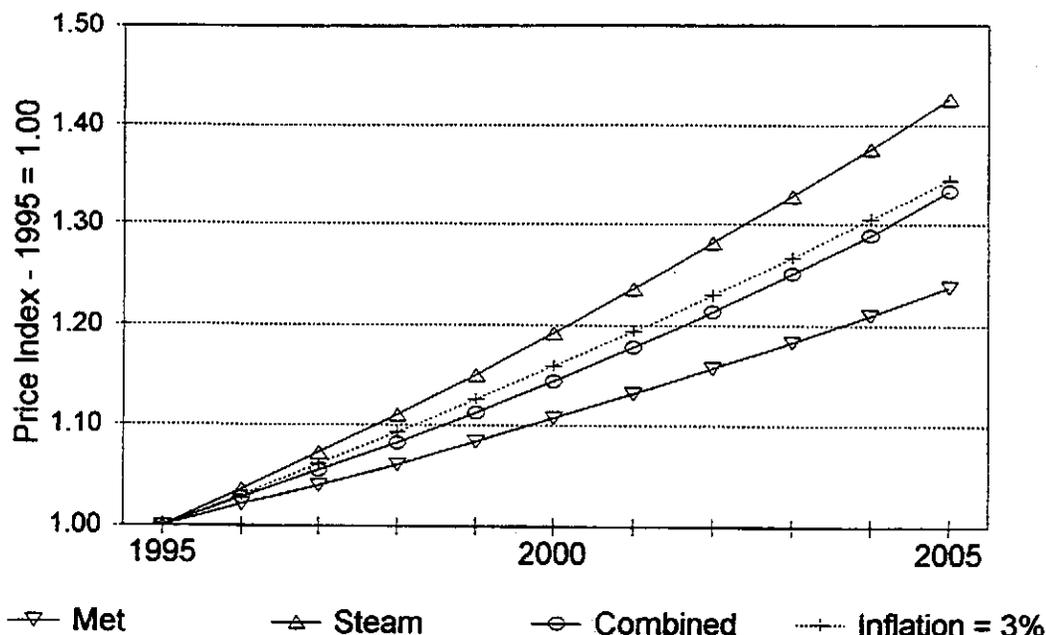
Open Investment Decisions

Parties representing mining firms also discussed several capital investment projects that are being evaluated currently (Figure 8). In some cases, the baseline production forecasts discussed above (*i.e.*, current expectations) assume that these projects will go forward as planned (“included in baseline”). However, major investment decisions are constantly reevaluated, and these investments are by no means assured. In these cases, producers stated that the existence of tax credits would help to assure that these planned investments will, in fact, go forward.

Several other major investments were discussed which are not represented in current production expectations (“not in baseline”) or as tax-credit effects. Parties representing the firms in question stated that factors other than the tax credits would be the primary determinants of whether these investments take place. If tax credits were established in a manner that allowed them to be viewed as stable, over the long term, they would be considered in decisions regarding these investments.

The effect of tax credits on open investment decisions (Figure 8) could be substantial. The tonnages represented by open investment decisions are large, compared to the production increases that would be expected as a direct result of tax credits. The parties involved were clear in stating that factors other than the tax credits would be the major influence on these open decisions. Therefore, potential effects of tax credits on open investments (Figure 8) have not been included in the results that follow.

Figure 9. Aggregated Coal Price Expectations (Metallurgical, Steam, and Combined Market) of Coal Producers, Compared to an Annual Inflation Rate of Three Percent



Market Prices

Coal producers were asked if they expected tax credits at any of the current levels to affect market prices. The majority replied in the negative. Parties representing firms that produce metallurgical coal as their primary product were unanimous in stating their opinions that the tax credit would have no such effect. Virginia's coal competes in domestic metallurgical markets based on quality while Virginia's export volumes are quite small relative to the overall market.

The majority of participating steam-coal producers do not expect Virginia tax credits to have an effect on market price. However, several producers that emphasize shipments to southeastern utilities felt that a large tax credit could have an effect on prices in those markets.

Other Results of Producer Survey

Price Expectations

Producers were asked about expectations regarding future coal prices, relative to inflation. The question applied to prices they expect to receive for coal produced by their own mines. In general, producers are relatively bullish about future steam-coal prices (Figure 9); they expect metallurgical coal prices to increase in current dollars, but to lag inflation. Several parties expect sharply higher steam coal prices to result from short supplies of Appalachian coals capable of meeting Phase II Clean Air Act requirements.

The combined price expectation of Figure 9 was calculated as a weighted composite of the metallurgical and steam price-index projections. This combined, aggregated price projection is very close to the expected rate

of inflation, *i.e.*, at an aggregated level, no significant real-dollar increase or decrease in average pricing is expected.

Productivity

Producers were asked to describe their expectations regarding future labor productivity trends in their own mines. The majority expectation is that deteriorating geologic conditions in Virginia deep mines will prevent Virginia producers from taking full advantage of continuing advances in mining technology. Several stated that they would feel fortunate to be able to maintain current productivity levels. The majority opinion was that deep-mine productivity will remain close to current levels.

Surface-mine producers were more optimistic with respect to future productivity gains. Generally speaking, there is an expectation that continued equipment improvement will enable surface mines to continue enjoying modest productivity gains.

Overview and Summary

Figures 10 and 11 compare cumulative production and overseas export expectations to 1990-1994 levels. The figures represent statewide production expectations; they have been extrapolated from the producer survey results, which represent 90 percent of Virginia's 1994 production and 89 percent of the export volume.

Projections of baseline production and tax credit impacts through the year 2000 are considered to be more reliable than projections beyond that year. The fact that tax credit effects appear to decline beyond 2000 may partially reflect the fact that, for most firms, this period lies beyond the realm of reasonable planning; therefore, it is difficult to state what effects a tax credit might or might not have.

Without the tax credits, Virginia coal production is expected to decline to about 32 million tons by the year 2000, approximately 16 percent below 1994 and 30 percent below 1990's record level. The current tax credit is expected to have little, if any, impact on this production decline. A tax credit at the current level, administered without a three-year delay and revenue surplus contingency, is expected to have a modest effect, while a non-delayed, non-contingent tax credit at double current levels would be expected to retain production at levels comparable to the projected 1995 figure through the year 2000. At triple current levels, modest production increases from 1995 forecast levels are expected through the year 2000.

Overseas coal exports are expected to increase slightly in 1995 and 1996, relative to 1994 levels. However, the decline in exports which occurred between 1990 and 1994 was quite steep. Beyond 1996 and without the tax credit, Virginia exports are expected to resume declining at a rate which appears roughly consistent with the trend established between 1990 and 1992. Over the 1992 - 1995 period, the year-to-year variations in Virginia overseas export shipments appear to be linked to currency valuation relationships between the U.S. dollar and the Australian dollar, as well as mining costs and longer-term market trends.

The effects of non-delayed, non-contingent tax credits on overseas exports are expected to increase with the magnitude of the tax credit through the year 2000. All Virginia producers expect to continue shipping overseas exports through the Port of Hampton Roads.

Figure 10. Total Virginia Coal Production: 1990 - 1994, and Projected Levels (with and without Tax Credits)

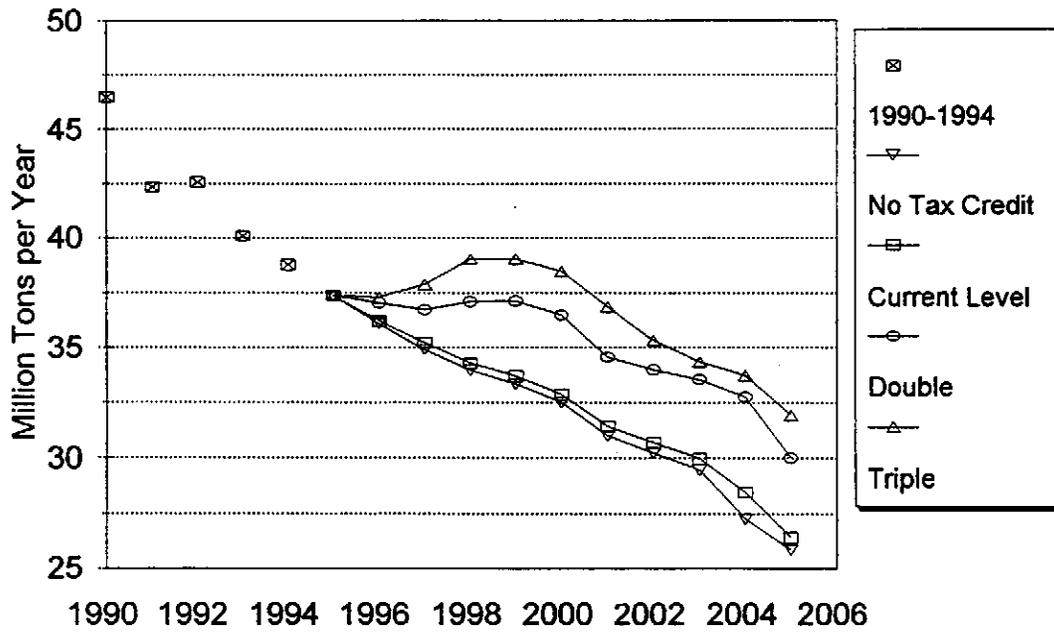


Figure 11. Virginia-Produced Coal Exports: 1990 - 1994, and Projected Levels (with and without Tax Credits)

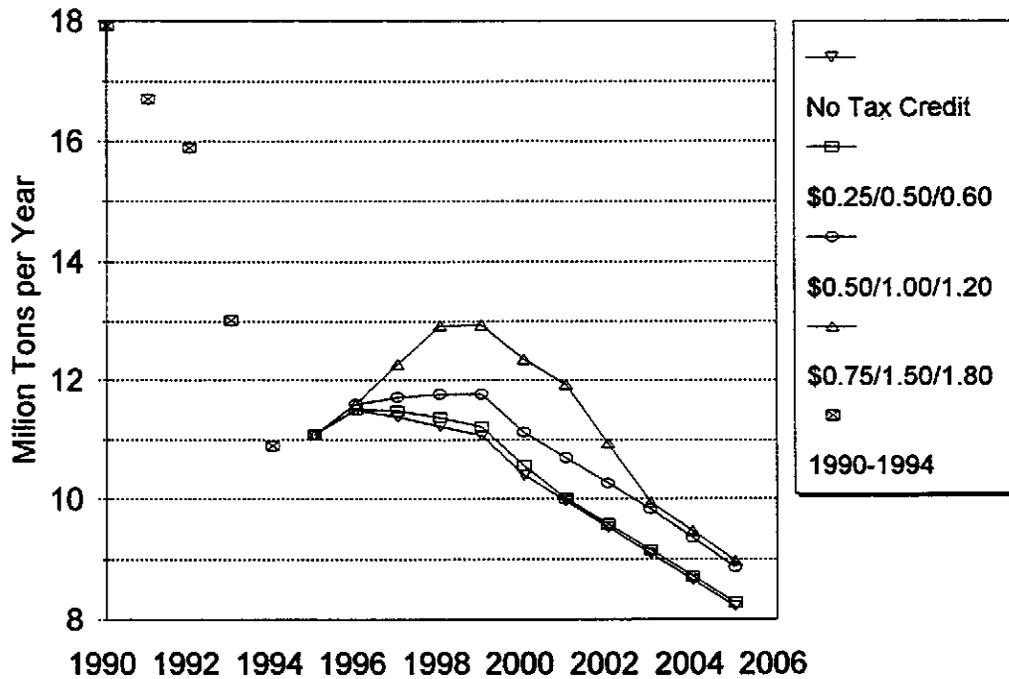


Table 5. Anticipated Cost of Current Tax Credit to State Treasury

Year	Cost (\$ million)
1999	14.9
2000	14.3
2001	14.0
2002	13.7
2003	13.2
2004	12.7
2005	12.3

Years represent periods when tax credits could be claimed. Companies mining coal in 1996 could claim credit for that coal in 1999, if 1997-98 state revenue is adequate.

Effects of the Current Tax Credit

Estimated costs of the current tax credit to the state are listed in Table 5. The costs were calculated based on projections of coal production expected to occur from mines within each of the three current tax-credit categories. Virginia utility sales projections are based on the coal-purchase expectations of Virginia utilities. Although coal producers state that the current tax credits would have a beneficial impact, no economic benefits of the current tax credit were quantified.

Statewide Effects of Non-Delayed, Non-Contingent Tax Credits

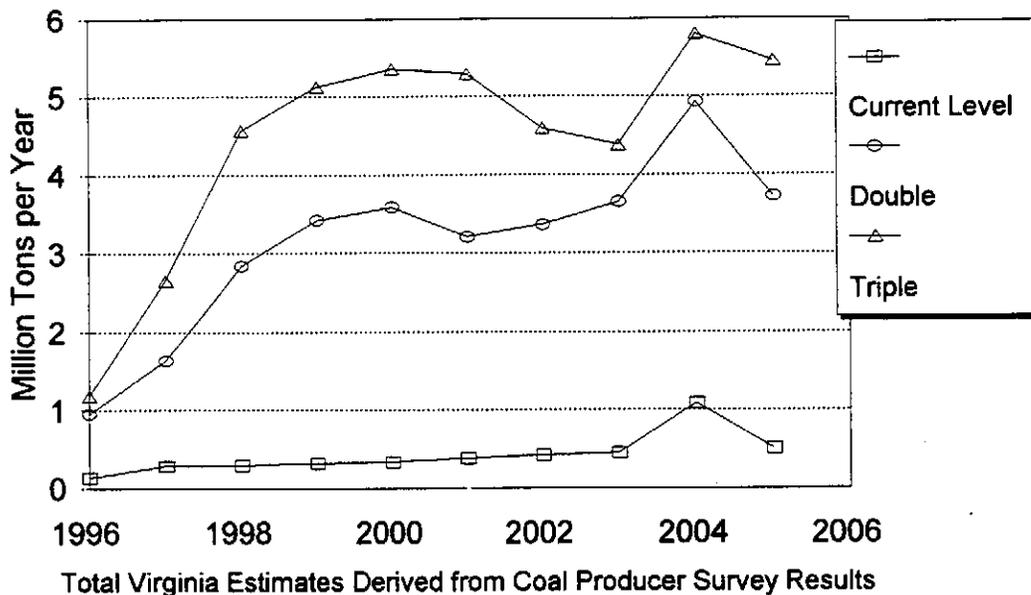
Economic impacts were calculated using methods similar to those of VCCER 95-1. Briefly, direct impacts were determined from primary data wherever possible. Indirect and induced impacts were calculated using economic multipliers derived from the IMPLAN input-output model and other sources, including Rose and Frias (1994). Multipliers were updated to a 1995-dollar basis when necessary. Economic impacts of coal movement through the Port of Hampton Roads were determined using multipliers provided by Yochum and Agarwal (Appendix E) specifically for this study.

In estimating future impacts, we assumed that the average price of coal, and the prices of all necessary inputs to coal production, remain constant with inflation. Producer-survey results justify use of this assumption for coal prices (Figure 9). This assumption is consistent with producer expectations of relatively constant labor productivity. Per-ton tax credits were assumed to remain at constant current-dollar values through time, as stated in the legislation.

The analysis was conducted in constant 1995 dollars; results were translated to current dollars using a three-percent annual inflation factor. All figures are listed in current dollars unless otherwise noted.

Economic impacts of the non-delayed, non-contingent tax credits are calculated based on the incremental production that is expected to occur if the proposed tax credits are passed into law (Figure 12). A *with vs. without* analysis was used for these calculations, *i.e.* each tax credit's impact was calculated as the difference between the impact of Virginia coal production and transport *with* the credit in place, and the impact of these activities at the lower tonnage likely to occur *without* a non-delayed, non-contingent tax credit being enacted.

**Figure 12. Projected Coal-Production Benefits of Tax Credits
(Estimated Incremental Coal Production Due to Non-Delayed,
Non-Contingent Tax Credits)**



Coal Production Effects

Calculation of the employment and payroll income effects associated with coal production, local trucking, and mine regulatory agency activity was conducted using factors and methods identical to those of VCCER 95-1. Multipliers, prices, and productivity relationships were updated from the 1993 basis of VCCER 95-1 to reflect the latest data available. VEC reports an average of 8405 coal industry jobs in 1994, a figure that is comparable to the VDMME estimate of 8316 mine workers. According to VDMME, 38.806 million tons of coal were produced by Virginia mines in 1994.

Our analysis does not account for differences in labor productivity between surface-mine and deep-mine production. Available multipliers do not discriminate between surface-mining and deep-mining activity. Although the per-ton labor requirements of surface mines are less than those of deep mines, requirements for non-labor inputs are greater; significant quantities of those non-labor inputs are purchased from local businesses.

Rail Transport Effects

Rail-transport effects are estimated based on transport revenues, as in the previous study. In-state per-ton revenue estimates for various routes were discussed with Norfolk Southern personnel. In developing rail-transport impact projections, we assumed that rail rates will remain constant with inflation.

Rail transport revenues were estimated for total rail shipments from Virginia coal-production facilities. As documented by EVA (1994), several million tons of coal are shipped into Virginia each year for processing and/or loading. As discussed in VCCER 95-1, rail transport of this “imported” coal is considered to be an economic impact of Virginia’s coal-producing industry.

In determining the current rail transport impacts, total revenues were estimated based upon the locations of markets served by Virginia producers, estimated tonnages shipped to each market, and in-state per-ton revenue estimates. Tonnages shipped to various markets were estimated through review of U.S. Department of Energy (EIA) data and information obtained from coal producers. Electric utility purchases and export shipments are well documented by EIA. However, EIA no longer publishes state-by-state data on domestic metallurgical and industrial steam shipments, so data from the early 1990s and coal-producer survey results were considered in preparing these estimates.

In projecting future rail transport revenues, we assumed that current geographic patterns of coal movement will continue, except in cases where available information provides an alternate indication.

In some cases, in-state rail transport revenues will not increase by the full amount of revenue generated by the credit-induced Virginia tonnages. For example, if a tax credit causes increased sales by a Virginia producer to an overseas customer currently served by a West Virginia mine, the net positive in-state impact of rail transportation will be less than would occur if the Virginia producer were to capture a customer currently served by an Australian supplier (rail routes from West Virginia mines to the Port pass through Virginia). Similar logic was used to estimate impacts of tax credits on rail transport to North American customers.

Activity at the Port of Hampton Roads

Port-related economic impacts are based on coal tonnages expected to be handled at the Port, including overseas exports and domestic (coastwise) shipments. All of the credit-induced Virginia-origin Port traffic is expected to occur as overseas export shipments.

As in estimating rail transport impacts, only "new" Port tonnages resulting from tax-credit-induced production were considered. Table F-1 (Appendix F) provides figures on the tonnages projected to move through the Port from Virginia mines without any tax credits in place ("coal handled"). Tables F-2 through F-4 provide figures on credit-induced Virginia production likely to move through the Port to overseas markets as a result of tax credits ("credit-induced Va. exports") and on the "new" tonnages expected to move through the Port as a result of tax credits ("incremental tonnages"). Multipliers obtained from Yochum and Agarwal (Appendix E) were applied to incremental tonnages in estimating economic impacts. The distinction between credit-induced and incremental tonnages is discussed in greater detail below.

State and Local Taxes

Tax-payment estimates were based on VCCER 95-1. The \$3.86 per-ton average estimated in the earlier document was disaggregated into state and local fractions based upon an assumed disposition of each of its six major components (VCCER 95-1, Table 4).

Total Economic Effects

Table 6 summarizes and compares economic impacts on a per-million-tons-of-coal basis. The 1995 total-jobs and tax-payment estimates are slightly less than those of VCCER 95-1 for two reasons: exports have decreased as a percentage of total production (exports generate greater per-ton transportation impacts than domestic shipments), and the ratio of mining jobs to production tonnage in 1994 decreased relative to the 1993 figures used to prepare VCCER 95-1. The per-million-ton payroll estimate for 1995 is slightly

Table 6. Estimated In-State Economic Benefits of Virginia Coal Production: 1993 Total, 1995 Total, and Incremental Effects of Non-Delayed, Non-Contingent Tax Credits

Benefit	1993	1995	Incremental
Jobs (per million tons)	926	875	770-800
Annual Payroll (\$/ton)	\$26.8	\$27.7	\$24-25
Annual Tax Revenues (\$/ton)	\$3.86	\$3.75	\$3.30-3.40

Notes: 1993 total in constant 1993 dollars from VCCER 95-1; 1995 total and incremental in 1995 dollars. "Incremental" refers to credit-induced effects during the 1996-2000 period. Tax revenues include both state and local.

greater than the 1993 estimate because the average annual wage has increased (VEC). Average impacts of incremental (credit-induced) production are less than average total impacts because only "new" transportation activity resulting from tax credits is considered as an economic impact of tax credits. The incremental impact averages are based on incremental production.

Table 6 expresses incremental impacts on a constant-1995 dollar basis so as to provide figures which are comparable to the 1995 totals. All other figures and tables express future economic impacts in current (*i.e.*, inflated) dollars.

Figures 13 and 14 represent the effects of tax credits on statewide employment and payroll income. The trends represented are a function of incremental coal production (Figure 12) and incremental economic impacts (Table 5). The number of jobs, and associated payroll income, generated by the double- and triple-current-level tax credits increase over the 1996 - 2000 period. Some of the new mines expected open as result of non-delayed, non-contingent tax credits will take several years to become operational at full capacity.

Figures 15 through 19 represent estimated tax revenue impacts of the tax credits. "Gross outlay" refers to the gross costs of various credits, calculated as a function of eligible tonnage in each tax-credit category times per-ton tax-credit amount (Table 5). "New revenues" refers to the state and local tax revenues that will be generated by the incremental coal production and transportation. "Net outlay" is calculated as "gross outlay" minus "new revenues." Approximately 55 percent of the new revenues are expected to accrue to the State Treasury, while 45 percent will be received at the local- government level (Appendix F, Table F-5); these are rough estimates.

Figures 15 through 17 represent the tax-revenue effects of non-delayed, non-contingent tax credits at the current level, double current level, and triple current level respectively, while Figures 18 and 19 compare tax-revenue effects of all three credit levels. New revenues generated by the double- and triple-current-level credits are estimated at 40-to-50 percent of gross outlays over the 1998-2000 period, while the estimated revenue effect of the current-level credit appears to be far less (Figure 18). As a result, net outlays resulting from the double-level credit exceed those of the current-level credit by an average of about one-third over the 1998 - 2000 period while generating 8 to 10 times as many jobs, according to these estimates. Net outlays for the triple credit exceed those of the double credit by 50 to 60 percent over the 1998-2000 period while increasing the number of jobs generated by a similar margin.

Figure 13. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on Statewide Employment

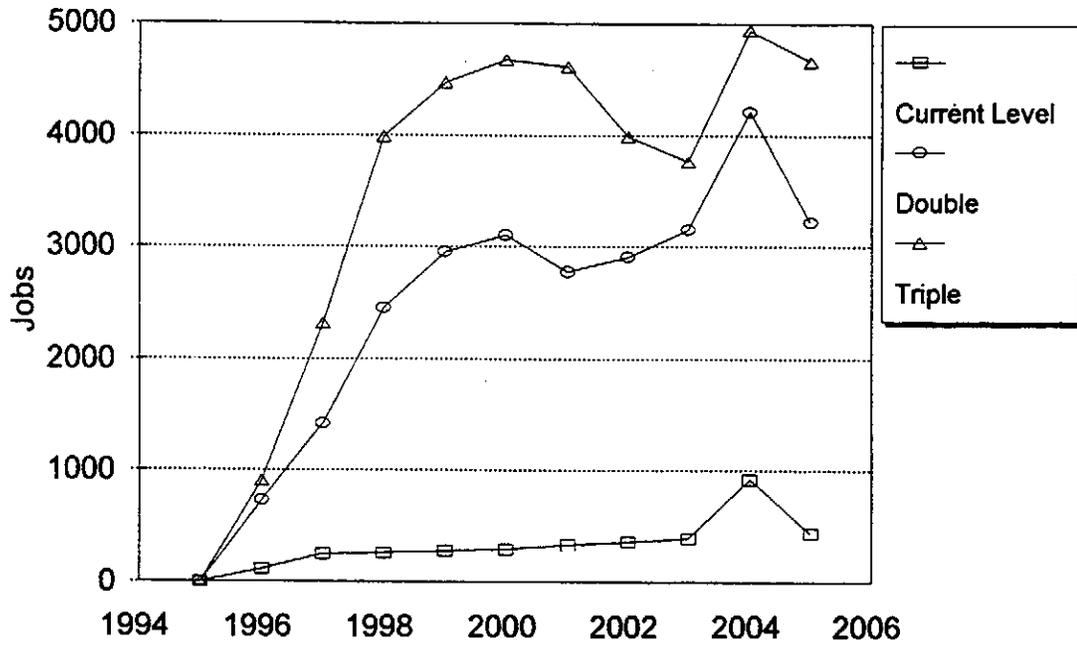


Figure 14. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on Statewide Payroll Income

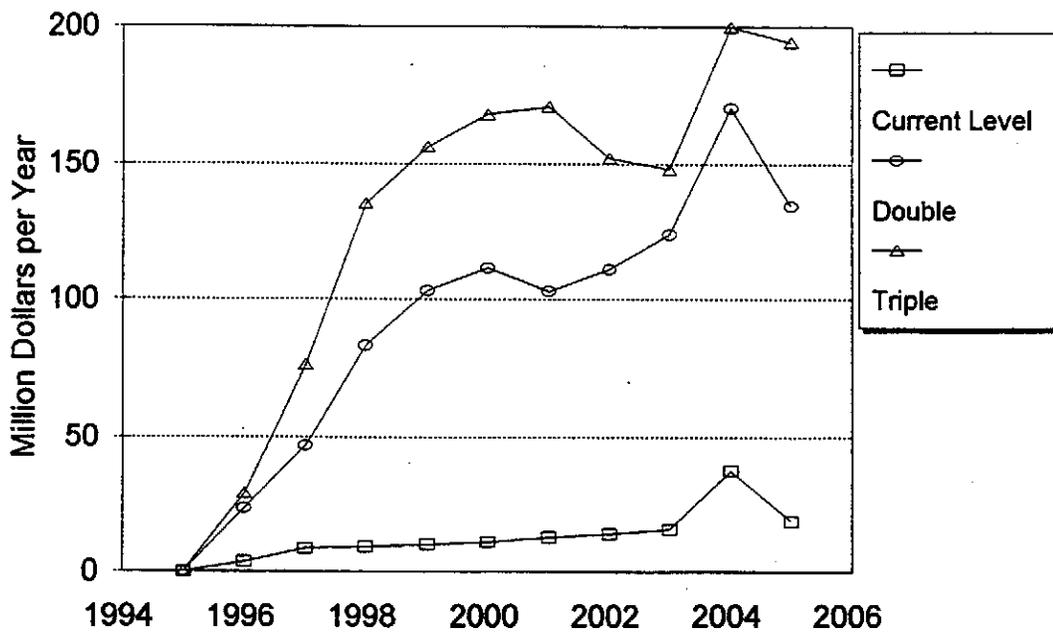


Figure 15. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Current Level

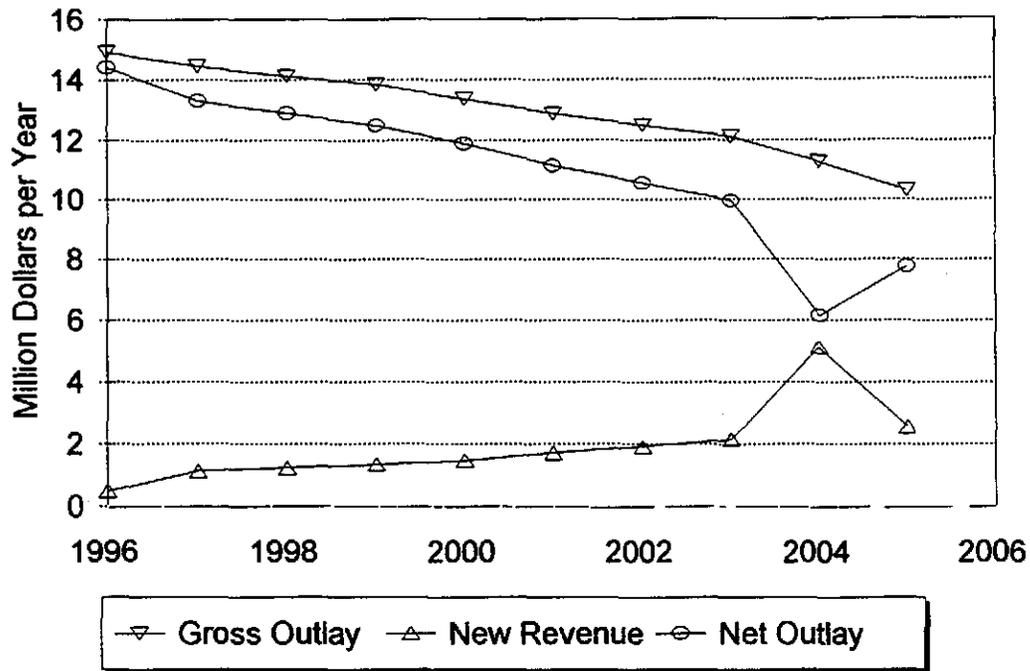


Figure 16. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Double Current Level

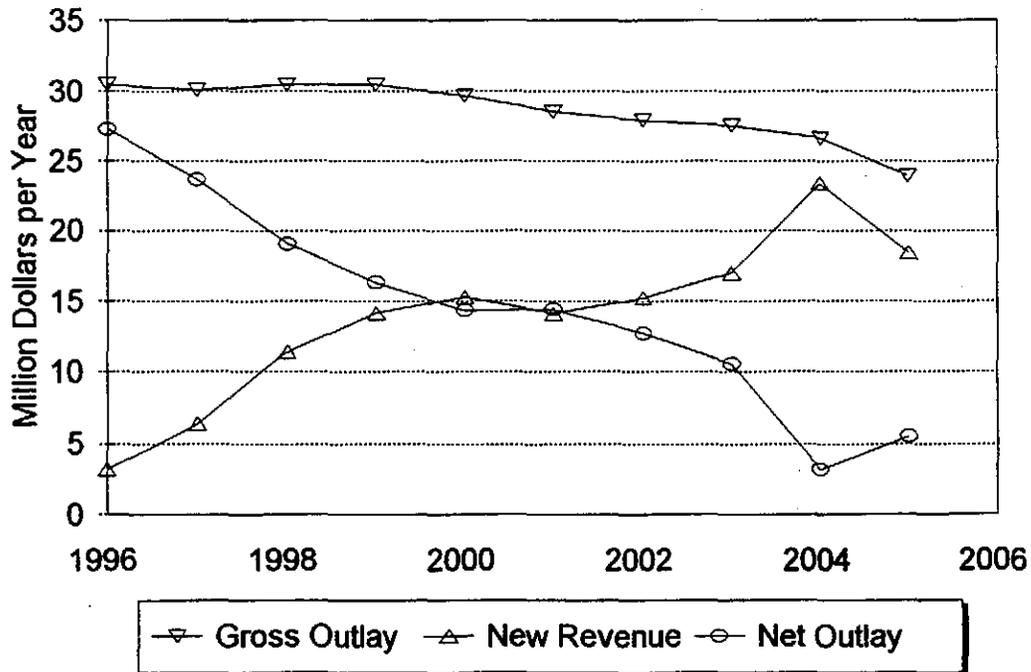


Figure 17. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - At Triple Current Level

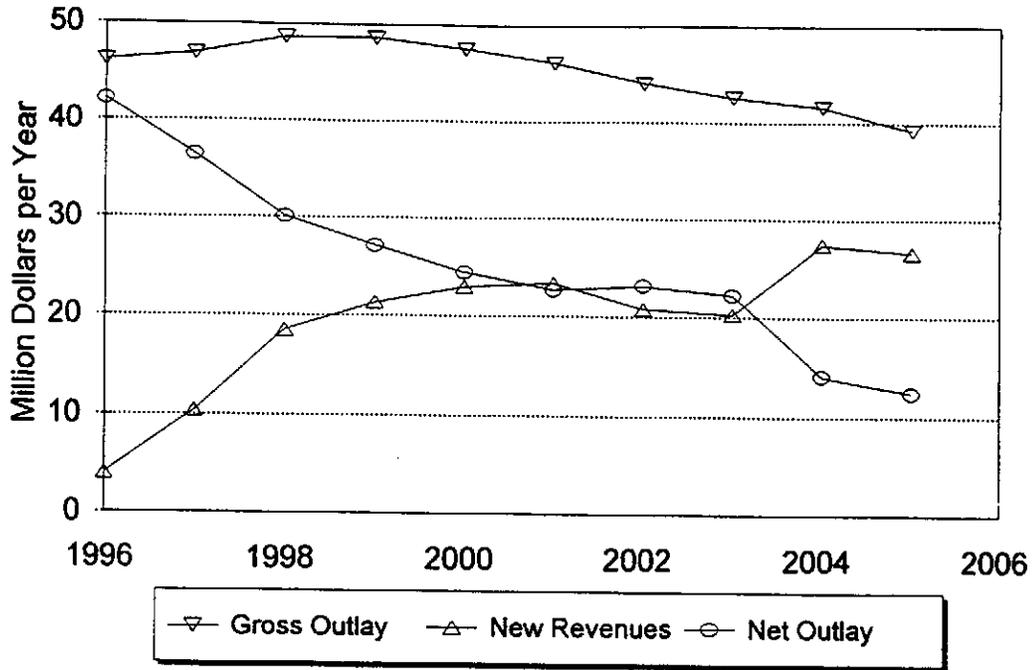


Figure 18. Projected Impacts of Non-Delayed, Non-Contingent Tax Credits on State/Local Government Revenue - New Revenues as Percent of Gross Outlay

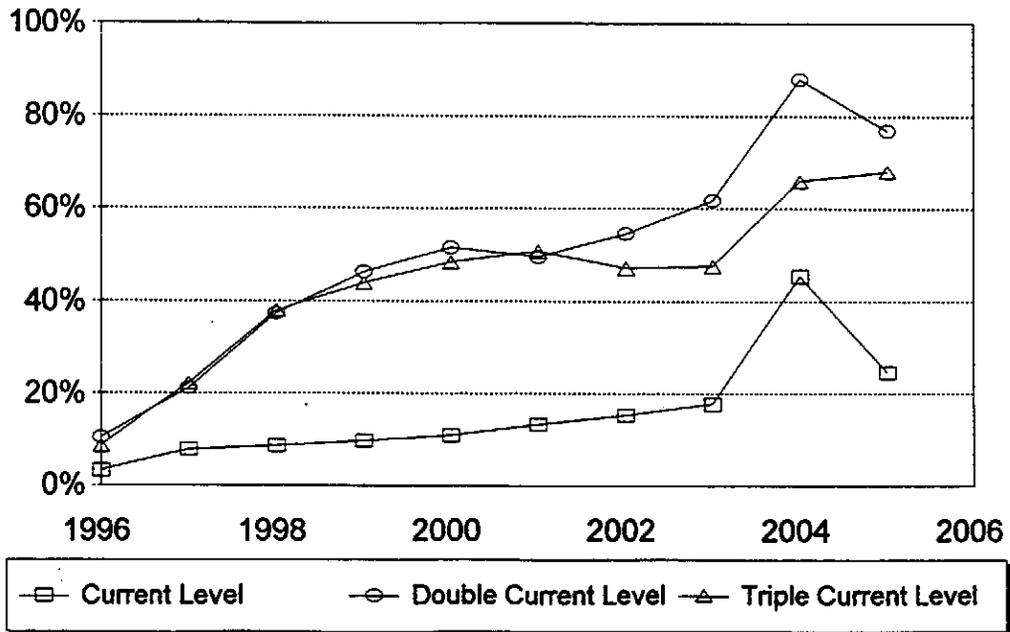
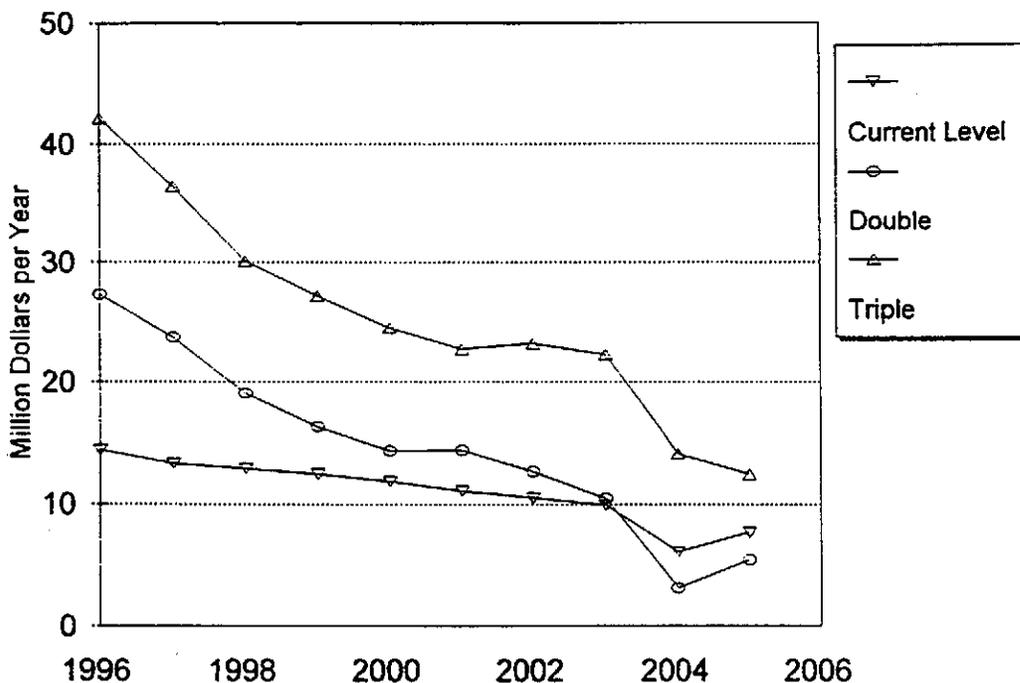


Figure 19. Projected Net Outlays Due to Non-Delayed, Non-Contingent Tax Credits



These figures represent only economic impacts which can be quantified based on information provided by coal producers. The effects of the current-level tax credits may be understated if its primary impact is on day-to-day decisions, as opposed to mine planning. The effects of tax credits on open-investment decisions (Figure 8) has not been quantified.

Effects of Tax Credits on Export Coal Businesses at Hampton Roads

The Current Tax Credit

The current production tax credit is not expected to have a substantive impact, either positive or negative, on employment at the Port. It is possible that the current tax credit could cause a slight increase in Virginia export tonnages, resulting in a small number of additional jobs at the Port. However, information obtained during this study does not allow any such effect to be quantified. The current tax credit would be very unlikely to have any negative impact on employment in coal-related businesses at the Port.

Non-Delayed, Non-Contingent Tax Credits

A non-delayed, non-contingent tax credits would help to assure that mining firms' current coal export projections are attained. Coal producers also expect such credits would result in additional coal export activity. Projected effects of non-delayed, non-contingent tax credits on coal export businesses at the Port of Hampton Roads are listed in Tables F-2 through F-4, Appendix F.

Two separate coal quantities are listed in Tables F-2 through F-4:

- *Credit-Induced Virginia Exports:* Additional coal exports from Virginia mines expected to occur as a direct result of tax credits.
- *Incremental Exports:* Additional tonnages handled by the Port as a direct result of tax credits. This quantity is equivalent to those credit-induced Virginia exports which displace current overseas exports that are *not* currently being shipped through the Port of Hampton Roads.

The rationale for this distinction is that total worldwide metallurgical coal shipments are not likely to be affected by the existence or amount of Virginia's production tax credits. Therefore, any increase in export sales by Virginia mines which occurs due to a tax credit will displace coal that would otherwise be shipped by non-Virginia suppliers. Credit-induced Virginia exports which displace non-Virginia export sales that are currently shipped through Hampton Roads result in no net benefit to the Port. Therefore, incremental exports are used as the basis for estimating tax-credit effects on coal export businesses at the Port of Hampton Roads. Assumptions used to discriminate these two coal quantities are reviewed in Appendix D. On average, incremental tonnages totaled about 50 percent of credit-induced exports.

Direct economic effects are calculated by applying the direct multipliers provided by Yochum and Agarwal (Appendix E) to incremental tonnages (Tables F-2 through F-4).

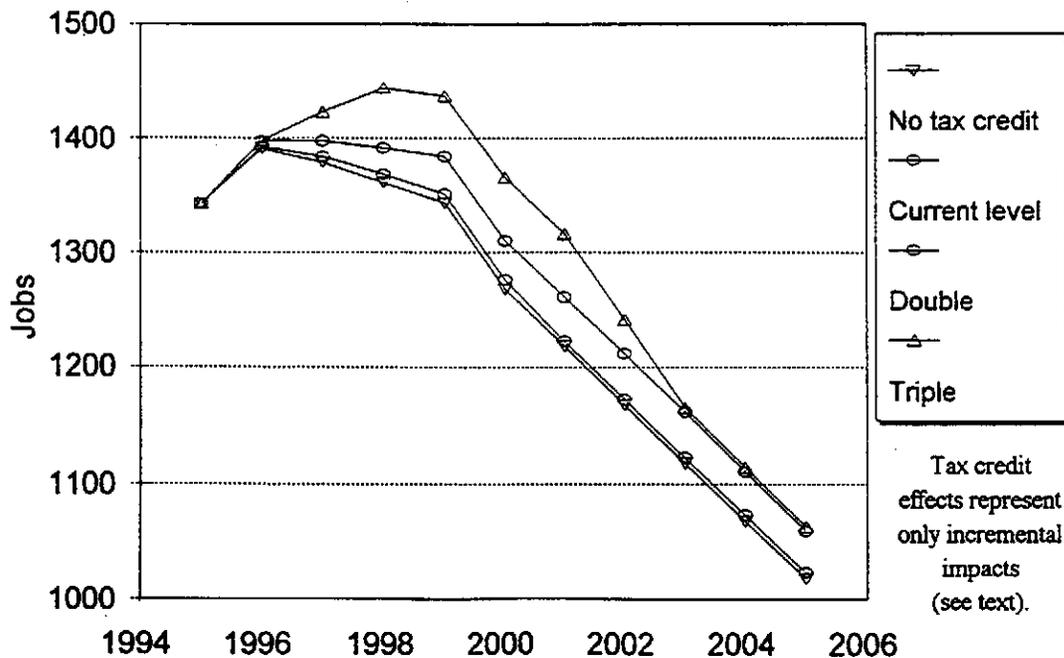
Yochum and Agarwal's indirect multipliers represent statewide impacts. We modified these multipliers to estimate the tax credits' indirect and induced impacts on coal-related businesses at Hampton Roads using location factors derived from IMPLAN; these factors, ranging from 0.8 to 0.95, were applied to the indirect statewide multipliers so as to estimate a set of local-impact multipliers appropriate for the Hampton Roads area.

The result yielded by this method of analysis is that production tax credits are likely to have a favorable impact on coal businesses the Port of Hampton Roads, but the magnitude of this impact appears small (Figure 20 ; Tables F-2 through F-4).

One factor leading to this result is that most of the tax-credit-induced export tonnages are expected to consist of mid-vol and high-vol metallurgical coals. West Virginia producers are very competitive in the high-vol metallurgical markets. Therefore, most of the credit-induced high-vol exports are expected to displace West Virginia tonnages. West Virginia producers can also compete effectively in the mid-vol markets by supplying mid-vol tonnages and by supplying high-vol product for blending with lower-vol coals. West Virginia producers are not competing as effectively for low-vol or pulverized-coal-injection (PCI) metallurgical markets. However, few tax-credit-induced export tonnages are expected to be destined for these market segments. The vast majority of West Virginia's metallurgical exports are shipped through the Port of Hampton Roads.

A non-delayed, non-contingent production tax credit is expected to have a positive impact on employment in coal-related businesses at the Port. A non-delayed, non-contingent tax credit at the current level is expected to produce 5 to 10 additional jobs in coal-export businesses at the Port through the year 2000. A non-delayed, non-contingent tax credit administered at double the current level would be expected to produce 30 to 45 additional jobs in coal-export businesses at the Port over the 1998-2000 period, while such a tax credit administered at triple the current level would be expected to produce 80 to 100 additional jobs at the Port over the same period.

Figure 20. Projected Impacts of Tax Credits on Employment Supported by Virginia-Mined Coal at Hampton Roads, Compared to No Tax Credit



Summary and Conclusions

Data obtained from Virginia coal industry sources indicate that a substantial decline in Virginia coal production is likely to occur over the next decade, if current market trends continue.

Two other recent studies (EVA, 1994; Crabtree and Topuz, 1995) have reached the conclusion that Virginia coal production is likely to decline over the next decade. Production projections by Virginia's coal-producing firms constituted the primary source of data for both of these studies. Crabtree and Topuz surveyed Virginia firms in 1993, prior to the current tax-credit proposal.

The expectation of declining Virginia production is consistent with information available from sources outside the Virginia coal industry. Parties in coal-related businesses, but with no financial interest in Virginia coal, confirmed the expectation of declining Virginia production. U.S. Department of Energy data show that Virginia's coal reserves have suffered from higher levels of depletion than reserves of other major U.S. coal mining areas. U.S. Department of Energy data also show that, over the 1990-1993 period, mine labor productivity was lower and increasing less rapidly in Virginia than in West Virginia and Kentucky. Virginia producers state that labor productivity advances in Virginia mines are hindered by the poor geologic conditions which result from reserve depletion and other factors unique to Virginia. Both reserve depletion and low labor productivity appear to be increasing Virginia mining costs, relative to principle competitors.

Projected effects of tax credits on coal production were derived from data provided by Virginia coal industry sources.

If left in its current form, the current tax credit is expected to cost the state between 12 and 15 million dollars annually from 1999 through 2005. Coal producers expect such a tax credit to provide some benefit, but no information is available to enable that benefit to be quantified. The three-year delay and revenue-surplus contingency conditions of the current tax credit are factors which prevent it from having a major influence on coal production, mine planning, or coal-marketing decisions.

Virginia coal industry representatives expect the employment-enhancing effect of a production tax credit would be increased if the three-year delay and state revenue surplus contingency clauses were removed from the legislation. That effect is expected to be relatively minor (less than ½ million tons per year and 300 jobs through the year 2000) for such a tax credit if administered at the current level. Such a tax credit would cost between 13 and 15 million dollars annually in foregone tax revenues through the year 2000. The foregone revenue estimate considers gross cost of the tax credit to the state (*i.e.* the amount of credits eligible to be claimed by coal producers) as well as the additional state and local government tax revenues that would be generated by credit-induced (incremental) coal production. The economic impact of such a credit would include on the order of 5 to 10 additional jobs at the Port.

If a non-delayed, non-contingent production tax credit were to be made available at double or triple current levels, Virginia coal industry sources expect that it would have a much greater effect.

At double current levels, production is expected to remain at close to 37 million tons annually through the year 2000, only slightly below the 38.8 million tons produced in 1994. Such a credit would cost approximately 27 million dollars in foregone tax revenues in 1996; this annual cost would decline to approximately 15 million dollars by the year 2000. The average annual cost over this period would be 20 million dollars in foregone tax revenues. The benefits would include an average of 2000 jobs, statewide. Between 1998 and 2000, 30 to 45 of these jobs would be located at the Port.

At triple current levels, production would be expected to rise to levels of 38 to 39 million tons over the 1998 - 2000 period, which is roughly equal to 1994 production. Such a credit would cost the state an average of \$32 million per year in foregone tax revenues (1996 - 2000) while generating an average 3000 jobs. Between the years 1999 and 2001 – when the tax credit would have maximum impact – over 4000 jobs would be created. Between 1998 and 2001, 80 to 100 of these jobs would be in coal-export businesses at the Port.

For all three of the non-delayed, non-contingent credits studied: costs to the state would be greatest shortly after implementation, while the resultant benefits would increase with time through the year 2000.

Beyond the year 2000, tax-credit effects are more difficult to project. Under all tax credit scenarios studied, production is expected to fall sharply during the 2001 - 2005 period. Because this period lies beyond the effective planning horizon of most mining firms, it is possible that the availability of tax credits could induce mine expansions that are not reflected in the data reported by this study. Base level production expectations reported by mining firms beyond the year 2000 are consistent with apparent longer-term trends.

Because the proposed tax credits are not indexed to inflation, both their cost to the state and relative effectiveness are likely to decline with time. The gap between current production levels and anticipated levels without tax credits also widens with time. Given these factors, it appears that - unless a fundamental change occurs coal market trends or mining technology - production tax credits at amounts considered in this study will be not capable of holding Virginia production close to current levels far into the next century.

Acknowledgements

This study was conducted with financial support provided by the Virginia Port Authority. Faculty time contributions by the Virginia Center for Coal and Energy Research, Virginia Tech, also supported the study. The authors wish to express their appreciation to the many individuals and firms that contributed coal production projections, other information, and valuable time to the study, as well as to Johanna Jones for preparation of the final document.

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Appendices

Appendix A. Virginia Coalfield Employment Enhancement Tax Credit Legislation

CHAPTER 775

An Act to amend the Code of Virginia by adding in Article 13 of Chapter 3 of Title 58.1 sections numbered 58.1-439.1 and 58.1-439.2 and to amend and reenact the third enactment of Chapter 730 of the 1988 Acts of Assembly, relating to coal industry tax credits.

[H 2575]

Approved April 6, 1995

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Article 13 of Chapter 3 of Title 58.1 sections numbered 58.1-439.1 and 58.1-439.2 as follows:

§ 58.1-439.1. *Coalfield employment enhancement tax credit.*

A. *For tax years beginning on and after January 1, 1996, but before January 1, 2001, any person who has an economic interest in coal mined in the Commonwealth shall be allowed a credit against the tax imposed by § 58.1-400 and any other tax imposed by the Commonwealth in accordance with the following:*

1. *For coal mined by underground methods, the credit amount shall be based on the seam thickness as follows:*

Seam Thickness	Credit per Ton
Under 33"	\$.60
33" and Above	\$.50

The seam thickness shall be based on the weighted average isopach mapping of actual coal thickness by mine as certified by a professional engineer. Copies of such certification shall be maintained by the person qualifying for the credit under this section for a period of three years after the credit is applied for and received and shall be available for inspection by the Department of Taxation. The Department of Mines, Minerals and Energy is hereby authorized to audit all information upon which the isopach mapping is based.

2. *For coal mined by surface mining methods, a credit in the amount of twenty-five cents per ton for coal sold in 1996, and each year thereafter.*

B. *In addition to the credit allowed in subsection A, for tax years beginning on and after January 1, 1996, any person who is a producer of coalbed methane shall be allowed a credit in the amount of one cent per million BTUs of coalbed methane produced in the Commonwealth against the tax imposed by § 58.1-400 and any other tax imposed by the Commonwealth on such person.*

C. *For purposes of this section, economic interest is the same as the economic ownership interest required by § 611 of the Internal Revenue Code which was in effect on December 31, 1977. A party who only receives an arm's length royalty shall not be considered as having an economic interest in coal mined in the Commonwealth.*

D. *If the credit exceeds the person's state tax liability for the tax year, the excess may be redeemable by the Tax Commissioner on behalf of the Commonwealth for ninety-five percent of the face value within ninety days after filing the return. If the Commonwealth does not redeem such excess amount, it shall be transferable by sale.*

E. *No person may utilize more than one of the credits on a given ton of coal described in subsection A. No person may claim a credit pursuant to this section for any ton of coal for which a credit has been claimed under § 58.1-433 or § 58.1-2626.1. Persons who qualify for the credit may not apply such credit to their tax returns prior to January 1, 1999, and only one year of credits shall be allowed annually beginning in 1999. No credit authorized by subsections A and B shall be taken by any taxpayer in 1999 unless general fund revenue in fiscal year 1997-98 exceeds the official estimate of general fund revenue by at least the cost of the credits authorized by subsections A and B as estimated by the Department of Taxation. In each following year no credit shall be taken by any taxpayer unless general fund revenue in the fiscal year ending the prior June 30 exceeds the official estimate of general fund revenue by at least the cost of the credits authorized by subsections A and B.*

§ 58.1-439.2. *Qualifying steam producers tax credit.*

For tax years beginning on and after January 1, 1996, but before January 1, 2001, a steam

producer shall be allowed a credit against the tax imposed by § 58.1-400 in the amount of three dollars per ton for each ton of coal mined in Virginia purchased by such steam producer. "Steam producer" means a person who sells steam energy to a manufacturing company in the Commonwealth or uses steam to produce manufactured goods. In order to receive the credit under this section, the steam producer shall include a certification from the coal producer that the coal was mined in Virginia. In no event shall the credit allowed hereunder exceed the total amount of tax liability of such steam producer. Any tax credit not usable for the taxable year may be carried over to the extent usable for the next five succeeding tax years or until the full credit is used, whichever is sooner.

2. That the third enactment of Chapter 730 of the 1988 Acts of Assembly is amended and reenacted as follows:

3. That the provisions of this act shall expire on December 31, ~~1996~~ 2001.

3. That the Virginia Port Authority shall undertake a study of the effect the Coalfield Enhancement Tax Credit has or will have on the export coal businesses at the Ports of Hampton Roads, and make its report to the chairmen of the Senate Finance and House Finance Committees by December 1, 1995.

4. That the Center for Public Service, in cooperation with the Virginia Port Authority, Department of Taxation, Department of Mines, Minerals and Energy, Department of Economic Development, the Office of the Attorney General, shall undertake a study of the policy, legal, and economic impacts of the credits authorized by §§ 58.1-433 and 58.1-2626.1 and to be authorized under this act, as well as the efficiency of such credits, and make its report to the Governor and the chairmen of the Senate Finance and House Finance Committees by December 1, 1995.

Appendix B. Economic Impacts of Coal

This analysis focuses on jobs, payroll income, and state and local tax payments generated by the Virginia coal industry as indicators of in-state economic impacts.

Employment and payroll supported by Virginia's coal mining industry (called *direct* effects), although substantial, are not a full measure of the industry's economic impact. As a basic industry, coal production also creates a variety of economic impacts due to "spinoff" effects. A portion of the revenues received by Virginia's coal producers are spent in Virginia's communities to purchase goods and services necessary to coal production; the business activity supported by these expenditures are the coal industry's *indirect* effects. In addition, wages and salaries received by coal industry employees, and by employees of supporting industries, are spent in Virginia communities; the economic activities supported by these expenditures are the *induced* economic impacts of the coal industry.

Transportation is essential to the creation of economic value which occurs through the mining of coal. As a bulky product, coal's transportation creates economic impacts which are substantial. The vast majority of Virginia's coal is transported from mines to processing and rail facilities by contract truckers who are not directly employed by the coal industry. Coal is moved from these facilities by rail to purchasers throughout Virginia, the eastern U.S., and the world. Exported coal, and a small portion of the Virginia coal industry's domestic sales which are moved by tidewater barge, create additional economic value when transferred and shipped at Virginia's Port of Hampton Roads.

The coal industry is also subject to regulation by government agencies at the state and federal levels. About 3/4 of this activity is supported by federal dollars that would not otherwise be spent in southwestern Virginia. Fees paid by the coal industry also help to support these agencies. Mining agency activity also has indirect and induced economic effects.

This analysis includes the effects of "backward linkages" (i.e. economic impacts of purchases of goods and services by coal and its supporting industries) but it does not consider "forward linked" impacts, such as electricity generation. The rationale for this approach is straightforward: Most Virginia industries that use Virginia coal would continue to operate, even if unable to procure coal from Virginia sources. The vast majority of backward-linked economic activity, however, would cease to occur within Virginia in the absence of Virginia coal mining.

Appendix C. Coal Producer Survey Information Request

The Virginia Center for Coal and Energy Research (VCCER) has been asked to study the impacts of the coal production tax credit on coal sales, the Virginia economy, and the Port of Hampton Roads. In addition, the Coal Subcommittee of the Virginia Coal and Energy Commission has asked VCCER to study potential impacts of tax credits at double and triple current levels.

The Virginia Coalfield Employment Enhancement Act establishes tax credits for coal produced in Virginia. The tax credit amount will depend upon production method: \$0.25 per ton for surface mined coal; \$0.50 per ton for deep-mine coal from seams 33 inches in thickness and above; \$0.60 per ton for deep-mine coal from seams thinner than 33 inches. Coal producers may apply for the tax credit after a three-year delay; for example, tax credit for coal mined in 1996 may be claimed in 1999. The tax credit will be available only if the state generates a revenue surplus during the fiscal year prior to the tax year during which the tax credit is claimed.

As one activity in conducting this study, we are seeking information from coal producers, sales agents, and brokers. We are asking you to participate in this study phase. We will contact you to discuss the following questions:

- What are current annual levels of coal production for and/or sales to various markets (export met, export steam, domestic met, Virginia utility, non-Virginia domestic steam) which occur under your authority?
- What are your expectations regarding coal prices, and total sales to various markets, over the next 5 to 10 years?
- What are your expectations regarding annual production for (sales to) various markets that are likely to occur under your authority over the next 5 to 10 years? How does Virginia-produced coal fit into these expectations?
- How does the current tax credit legislation affect your expectations regarding future production and sales?
- If the tax credit for each ton of Virginia coal were to be available without any major delay, and if state revenues were to have no influence on tax credit availability: How would tax credits at current levels, double current levels, and triple current levels be likely to influence your expectations regarding future production and sales?
- Would the availability of a tax credit at levels discussed above be sufficient to increase your company's mineable reserves?
- What types of effects would a tax credit at levels discussed above be likely to have on your company's mine investment decisions?

Any information obtained through the survey will be treated as confidential. No information on individual companies will be contained in our report; only aggregated information will be released.

Appendix D. Coal Transport Impact Assumptions

As discussed in the text, the transportation of tax-credit-induced coal production will have a net positive impact only to the extent that transportation of tax-credit-induced Virginia production does not displace coal being transported through Virginia from an out-of-state mine. In estimating the transportation impacts of credit-induced production, we made the following assumptions:

Overseas Exports

West Virginia (and, to a lesser extent) Kentucky producers are Virginia producers' major domestic competition for these markets. We assumed that:

For credit-induced high-vol exports, the probability is 70 percent that this market would be captured from a West Virginia or a Kentucky producer currently shipping through the Port.

For credit-induced mid-vol exports, the probability is 50 percent that this market would be captured from a West Virginia or a Kentucky producer currently shipping through the Port.

For credit-induced low-vol exports, the probability is 30 percent that this market would be captured from a West Virginia or a Kentucky producer currently shipping through the Port.

For credit-induced exports to PCI facilities, the probability is 20 percent that this market would be captured from a West Virginia or a Kentucky producer currently shipping through the Port.

Domestic Shipments

For credit-induced shipments to midwestern and Canadian locations: the probability is 100 percent that these shipments will not displace any current Virginia rail traffic.

For credit-induced shipments from the Buchanan County area to in-state industrial accounts, the northeast, and the Baltimore area: there is an 80 percent probability that this will not displace any current Virginia rail traffic. The most likely competitors for these markets are in West Virginia, and most West Virginia origin rail traffic to northeastern destinations does not travel through Virginia.

For credit-induced coal originating south of the Buchanan County area for shipment to in-state locations and points further north and east: there is a 50 percent probability that these shipments will displace current Virginia rail traffic.

For credit-induced shipments to the southeast: The primary competitors for these markets are located in eastern Kentucky. There is a 25 percent probability that shipments from eastern Kentucky to these markets will travel through Virginia.

Additional Factors

Rail revenues are estimated individually; a "50 percent probability of displacing current Virginia rail traffic" does not necessarily imply only a 50 percent gain in revenue.

None of the production tax credits considered by this study are expected to affect shipments from Virginia mines to Virginia utilities.

Appendix E. Hampton Roads Area Economic Multipliers.

Gilbert Yochum and Vinod Agarwal
Old Dominion University

The objective of this section is to estimate the jobs, payroll and taxes generated within the Hampton Roads MSA by an incremental one million ton increase or decrease in coal shipments through the port of Hampton Roads. Unless otherwise noted, the definition of terms used in this section will be the same as those employed in the *Economic Impact and Rate of Return of Virginia's Ports on the Commonwealth* (Yochum and Agarwal, 1992; referenced hereafter as "1992 Port Study").

Methodology

Due to data and time limitations, the forecasting method of this study is simply and straightforward. It is assumed that technological and institutional change in this industry will remain relatively constant over the forecast period. Jobs, per million ton change in coal shipments, are estimated by dividing the average productivity per worker involved in the shipment of coal through the port into one million tons. Average productivity is defined as tons of coal moved through the port per worker per year. The data used to calculate average productivity are estimated from the microeconomic data base of the 1992 Port Study.

Payroll, per million ton change in coal shipments, is the product of the jobs estimates outlined above and mean income by industry category derived from the 1992 Port Study. Taxes (state and local) are the product of jobs and mean taxes by industry category derived from the 1992 Port Study.

Indirect job, payroll and tax effects on the Commonwealth are estimated for the short-term by processing direct effects through the RIMS II input-out model. Indirect long-term effects are estimated by processing direct effects through location-quotient multipliers outlined in the 1992 Port Study.

Results

Tables 1, 2 and 3 summarize the forecast estimates of the direct effect in the Hampton Roads MSA on jobs, payroll and taxes of a one million ton increase or decrease in coal shipments through the port and the indirect effect on both Hampton Roads and the Commonwealth.

TABLE E-1
JOBS
 Generated/Destroyed by a One Million Ton Increase/Decrease
 in Coal Shipments through the Port of Hampton Roads

	Direct*	Indirect**	
		Short Term	Long-Term
Vessel Service	5	3.35	7.45
Owner/Agent	2	1.34	2.98
Tonnage	3	2.01	4.47
Repair	12	8.04	17.88
Rail	38	25.46	56.62
Misc.	12	8.04	17.88
TOTAL	72	48.24	107.28

TABLE E-2
PAYROLL
 Generated/Destroyed by a One Million Ton Increase/Decrease
 in Coal Shipments through the Port of Hampton Roads

	Direct* (\$)	Indirect**	
		Short Term	Long-Term
Vessel Service	\$167,785	\$85,570.35	\$191,274.9
Owner/Agent	\$62,522	\$31,886.22	\$71,275.08
Tonnage	\$89,764	\$45,779.64	\$102,330.96
Repair	\$352,809	\$79,932.59	\$404,202.26
Rail	\$1,595,582	\$813,746.82	\$1,818,963.48
Misc.	\$335,211	\$170,957.61	\$382,140.54
TOTAL	\$2,603,673	\$1,327,873.23	\$2,968,187.22

*All payroll created/destroyed in Hampton Roads
 **Payroll created/destroyed in Hampton Roads and throughout Virginia

TABLE 3
TAXES
 Generated/Destroyed by a One Million Ton Increase/Decrease
 in Coal Shipments through the Port of Hampton Roads

	Direct* (\$)	Indirect**	
		Short Term	Long-Term
Vessel Service	\$18,792	\$9,583.9	\$21,422.9
Owner/Agent	\$7,104	\$3,623.0	\$8,098.6
Tonnage	\$10,236	\$5,220.4	\$11,669.0
Repair	\$40,449	\$20,629.0	\$46,111.9
Rail	\$181,654	\$92,643.5	\$207,085.6
Misc.	\$38,028	\$19,394.3	\$43,351.9
TOTAL	\$296,263	\$151,094.1	\$337,739.8

*All taxes created/destroyed in Hampton Roads

**Taxes created/destroyed in Hampton Roads and throughout Virginia

Appendix F.
Economic Impact Projection Estimates

- Table F-1.** Summary of Virginia Coal Production Economic Impacts with No Tax Credit, and Estimated Costs of Current Tax Credit.
- Table F-2.** Summary of Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Current Level.
- Table F-3.** Summary of Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Double Current Level.
- Table F-4.** Summary of Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Triple Current Level.
- Table F-5.** Summary of Tax Credit Fiscal Impacts on State and Local Governments.
- Table F-6.** Summary of Southwest Virginia Coal Production Economic Impacts with No Tax Credit.
- Table F-7.** Summary of Southwest Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Current Level.
- Table F-8.** Summary of Southwest Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Double Current Level.
- Table F-9.** Summary of Southwest Virginia Coal Production Economic Impacts: Estimated Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Triple Current Level.

Table F-1. Summary of Virginia Coal Production Economic Impacts , with No Tax Credit, and Estimated Costs of Current Tax Credit. (All costs in Current Dollars).

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Statewide Economic Impacts												
Coal Production (million tons)	38.8	37.3	36.0	34.8	33.9	33.3	32.4	30.9	30.2	29.4	27.2	25.8
Business Revenues (\$ billion)	2.78	2.76	2.78	2.78	2.78	2.81	2.82	2.77	2.78	2.79	2.68	2.6
Employment (1000 jobs)												
Coal Mining Firms	8.4	8.1	7.8	7.5	7.3	7.2	7.0	6.7	6.5	6.4	5.9	5.6
Other Direct	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.1	4.0	3.9	3.7	3.5
Indirect and Induced	20.5	19.8	19.3	18.8	18.2	17.9	17.4	16.6	16.2	15.8	14.7	14.0
Total	33.8	32.6	31.9	30.9	30.1	29.6	28.8	27.4	26.7	26.0	24.3	23.1
Payroll (\$ million)												
Direct	551	549	554	555	556	563	564	553	555	557	536	525
Indirect and Induced	487	484	487	486	487	493	494	485	487	489	469	459
Total	1,038	1,033	1,041	1,041	1,043	1,056	1,058	1,038	1,043	1,046	1,005	985
Tax Payments (\$ millions)												
Direct	49	48	49	49	49	49	49	49	49	49	47	46
Indirect and Induced	92	91	92	92	92	93	94	92	92	93	89	87
Paid to State (est.)	76	76	77	77	77	78	78	76	77	77	74	73
Paid to Local (est.)	64	64	64	64	64	65	65	64	64	64	62	60
Total Tax Collections	141	140	141	141	141	143	143	140	141	142	136	133
Gross Cost of Tax Credit						14.9	14.3	14.0	13.7	13.2	12.7	12.3
Businesses at Hampton Roads												
Coal Handled (million tons)	11.8	12.0	12.4	12.3	12.1	12.0	11.3	10.9	10.4	10.0	9.5	9.1
Business Revenues (\$ million)	61	64	68	70	71	72	70	69	69	68	67	65
Employment												
Direct	848	861	892	884	873	862	813	781	749	717	685	653
Indirect and Induced	474	482	499	494	488	482	455	437	419	401	383	365
Total	1,322	1,343	1,391	1,379	1,361	1,344	1,268	1,218	1,168	1,118	1,068	1,018
Payroll (\$ million)												
Direct	30	31	33	34	34	35	34	34	33	33	32	32
Indirect and Induced	14	15	16	16	16	16	16	16	16	15	15	15
Total	44	46	49	50	51	52	50	50	49	48	47	47
State and Local Taxes (\$ million)												
Direct	3.4	3.5	3.8	3.9	3.9	4.0	3.9	3.8	3.8	3.7	3.7	3.6
Indirect and Induced	1.6	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7
Total	5.0	5.2	5.6	5.7	5.8	5.9	5.7	5.6	5.6	5.5	5.4	5.3

Table F-2. Summary of Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Statewide Economic Impacts										
Coal Production (million tons)	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	1.2	0.6
Business Revenues (\$ million)	10	23	25	27	29	34	38	43	102	51
Employment (jobs)										
Coal Mining Firms	31	70	72	77	81	94	102	110	263	123
Other Direct	13	30	32	34	36	39	42	46	98	51
Indirect and Induced	70	155	162	173	183	207	224	243	563	271
Total	114	255	266	284	300	339	368	398	924	445
Payroll (\$ million)										
Direct	2	4	5	5	6	7	7	8	19	10
Indirect and Induced	2	4	4	5	5	6	7	8	18	9
Total	4	8	9	10	11	13	14	16	37	19
Fiscal Impacts(\$ millions)										
New Revenues - Direct	0.2	0.4	0.4	0.5	0.5	0.6	0.7	0.7	1.8	0.9
New Revenues - Ind. and Ind.	0.3	0.8	0.8	0.9	1.0	1.1	1.3	1.4	3.4	1.7
New Revs. to State (est.)	0.3	0.6	0.7	0.7	0.8	0.9	1.1	1.2	2.8	1.4
New Revs. to Local (est.)	0.2	0.5	0.6	0.6	0.7	0.8	0.9	1.0	2.3	1.2
Total New Revenues	0.5	1.2	1.2	1.4	1.5	1.7	1.9	2.2	5.1	2.6
Gross Cost of Tax Credit	14.9	14.5	14.1	13.8	13.4	12.9	12.5	12.1	11.3	10.3
Businesses at Hampton Roads										
Credit-Induced Va. Exports (million tons)	0.02	0.10	0.15	0.16	0.16	0.05	0.05	0.06	0.06	0.06
Incremental Exports (million tons)	0.01	0.05	0.07	0.07	0.07	0.04	0.04	0.04	0.05	0.05
Business Revenues (\$ million)	0.04	0.14	0.19	0.20	0.21	0.12	0.13	0.15	0.16	0.17
Employment										
Direct	1	4	5	5	5	3	3	3	3	4
Indirect and Induced	1	2	3	3	3	2	2	2	2	2
Total	1	6	7	8	8	4	5	5	5	6
Payroll (\$1000)										
Direct	35	137	187	201	215	122	134	146	159	173
Indirect and Induced	17	64	88	94	100	57	63	69	75	81
Total	52	201	275	295	315	179	197	215	234	254
State and Local Taxes (\$1000)										
Direct	4	16	21	23	24	14	15	17	18	20
Indirect and Induced	2	7	10	11	11	7	7	8	8	9
Total	6	23	31	34	36	20	22	24	27	29

Table F-3. Summary of Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Double the Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Statewide Economic Impacts										
Coal Production (million tons)	1.0	1.8	3.2	3.8	4.0	3.6	3.7	4.1	5.5	4.1
Business Revenues (\$ million)	64	127	226	281	304	280	303	337	465	366
Employment (jobs)										
Coal Mining Firms	206	395	684	823	863	771	810	878	1,187	896
Other Direct	81	159	273	332	349	314	329	354	459	362
Indirect and Induced	447	863	1,493	1,800	1,888	1,691	1,773	1,920	2,567	1,961
Total	733	1,417	2,451	2,954	3,100	2,776	2,912	3,152	4,213	3,219
Payroll (\$ million)										
Direct	12	24	43	53	58	53	57	64	88	69
Indirect and Induced	11	23	40	50	54	50	54	60	83	65
Total	23	47	83	103	112	103	111	124	170	134
Fiscal Impacts(\$ millions)										
New Revenues - Direct	1.1	2.2	4.0	4.9	5.3	4.9	5.3	5.9	8.1	6.4
New Revenues - Ind. and Ind.	2.1	4.2	7.4	9.2	10.0	9.2	10.0	11.1	15.3	12.0
New Revs. to State (est.)	1.8	3.5	6.2	7.7	8.3	7.7	8.3	9.2	12.7	10.0
New Revs. to Local (est.)	1.5	2.9	5.2	6.5	7.0	6.4	7.0	7.8	10.7	8.4
Total New Revenues	3.2	6.4	11.4	14.2	15.3	14.1	15.2	17.0	23.4	18.4
Gross Cost of Tax Credit	30.5	30.1	30.5	30.5	29.7	28.5	27.9	27.5	26.6	24.0
Businesses at Hampton Roads										
Credit-Induced Va. Exports(million tons)	0.11	0.34	0.55	0.71	0.73	0.74	0.75	0.75	0.70	0.65
Incremental Exports (million tons)	0.06	0.17	0.27	0.36	0.38	0.38	0.39	0.39	0.38	0.37
Business Revenues (\$ million)	0.16	0.47	0.77	1.05	1.14	1.19	1.25	1.30	1.30	1.30
Employment										
Direct	4	12	20	26	27	28	28	28	28	27
Indirect and Induced	2	7	11	14	15	15	16	16	15	15
Total	7	19	30	40	42	43	44	44	43	42
Payroll (\$1000)										
Direct	180	466	771	1,054	1,142	1,193	1,246	1,301	1,300	1,298
Indirect and Induced	75	218	381	494	535	559	584	609	609	608
Total	235	685	1,133	1,548	1,677	1,751	1,829	1,910	1,909	1,905
State and Local Taxes (\$1000)										
Direct	18	53	88	120	130	136	142	148	148	148
Indirect and Induced	9	25	41	56	61	64	66	69	69	69
Total	27	78	129	176	191	199	208	217	217	217

Table F-4. Summary of Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Triple the Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Statewide Economic Impacts										
Coal Production (million tons)	1.2	3.0	5.1	5.7	6.0	5.9	5.1	4.9	6.5	6.1
Business Revenues (\$ million)	79	208	368	425	458	466	414	403	546	530
Employment (jobs)										
Coal Mining Firms	256	641	1,101	1,235	1,290	1,274	1,107	1,055	1,397	1,314
Other Direct	98	265	460	516	539	533	454	418	535	509
Indirect and Induced	553	1,411	2,428	2,724	2,845	2,810	2,428	2,295	3,013	2,843
Total	907	2,318	3,989	4,475	4,674	4,617	3,989	3,767	4,945	4,666
Payroll (\$ million)										
Direct	15	40	70	81	87	89	79	76	103	100
Indirect and Induced	14	37	65	75	81	82	73	72	97	94
Total	29	76	135	156	168	171	152	148	200	194
Fiscal Impacts(\$ millions)										
New Revenues - Direct	1.4	3.6	6.4	7.4	8.0	8.1	7.2	7.1	9.5	9.3
New Revenues - Ind. and Ind.	2.6	6.8	12.1	14.0	15.0	15.3	13.6	13.3	17.9	17.4
New Revs. to State (est.)	2.2	5.7	10.1	11.6	12.5	12.7	11.3	11.0	14.9	14.5
New Revs. to Local (est.)	1.8	4.8	8.5	9.8	10.5	10.7	9.5	9.3	12.5	12.2
Total New Revenues	4.0	10.5	18.5	21.4	23.0	23.4	20.9	20.3	27.5	26.7
Gross Cost of Tax Credit	46.2	46.9	48.6	48.6	47.5	46.2	44.1	42.6	41.6	39.2
Businesses at Hampton Roads										
Credit-Induced Va. Exports(million tons)	0.11	0.91	1.74	1.91	1.99	2.00	1.43	0.87	0.82	0.77
Incremental Exports (million tons)	0.06	0.40	0.74	0.84	0.87	0.88	0.65	0.43	0.42	0.41
Business Revenues (\$ million)	0.16	1.10	2.11	2.45	2.63	2.72	2.09	1.41	1.42	1.42
Employment										
Direct	4	29	53	60	63	63	47	31	30	29
Indirect and Induced	2	16	30	34	35	35	26	17	17	16
Total	7	45	83	94	98	98	73	48	47	45
Payroll (\$1000)										
Direct	160	1,099	2,114	2,448	2,629	2,725	2,089	1,414	1,416	1,418
Indirect and Induced	75	515	990	1,146	1,232	1,276	979	662	664	664
Total	235	1,613	3,104	3,594	3,861	4,001	3,068	2,077	2,080	2,082
State and Local Taxes (\$1000)										
Direct	18	125	241	278	299	310	238	161	161	161
Indirect and Induced	9	59	113	130	140	145	111	75	75	76
Total	27	184	353	409	439	455	349	236	237	237

Table F-5. Summary of Tax Credit Fiscal Impacts on State and Local Governments (\$ millions)

	Calendar	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<i>Total Impacts of Coal Mining and Transport without Credit, and Cost of Current Tax Credit:</i>												
Direct		48	49	49	49	49	49	49	49	49	47	46
Indirect and Induced		91	92	92	92	93	94	92	92	93	89	87
Paid to State (est.)		76	77	77	77	78	78	76	77	77	74	73
Paid to Local (est.)		64	64	64	64	65	65	64	64	64	62	60
Total Tax Collections		140	141	141	141	143	143	140	141	142	136	133
Gross Cost of Tax Credit						14.9	14.3	14.0	13.7	13.2	12.7	12.3
<i>Incremental Impact: Non-Delayed, Non-Contingent Credit at Current Level</i>												
New Revenues - Direct			0.2	0.4	0.4	0.5	0.5	0.6	0.7	0.7	1.8	0.9
New Revenues - Ind. and Ind.			0.3	0.8	0.8	0.9	1.0	1.1	1.3	1.4	3.4	1.7
New Revs. to State (est.)			0.3	0.6	0.7	0.7	0.8	0.9	1.1	1.2	2.8	1.4
New Revs. to Local (est.)			0.2	0.5	0.6	0.6	0.7	0.8	0.9	1.0	2.3	1.2
Total New Revenues			0.5	1.2	1.2	1.4	1.5	1.7	1.9	2.2	5.1	2.6
Gross Cost of Tax Credit			14.9	14.5	14.1	13.8	13.4	12.9	12.5	12.1	11.3	10.3
<i>Incremental Impact: Non-Delayed, Non-Contingent Credit at Double Current Level</i>												
New Revenues - Direct			1.1	2.2	4.0	4.9	5.3	4.9	5.3	5.9	8.1	6.4
New Revenues - Ind. and Ind.			2.1	4.2	7.4	9.2	10.0	9.2	10.0	11.1	15.3	12.0
New Revs. to State (est.)			1.8	3.5	6.2	7.7	8.3	7.7	8.3	9.2	12.7	10.0
New Revs. to Local (est.)			1.5	2.9	5.2	6.5	7.0	6.4	7.0	7.8	10.7	8.4
Total New Revenues			3.2	6.4	11.4	14.2	15.3	14.1	15.2	17.0	23.4	18.4
Gross Cost of Tax Credit			30.5	30.1	30.5	30.5	29.7	28.5	27.9	27.5	26.6	24.0
<i>Incremental Impact: Non-Delayed, Non-Contingent Credit at Triple Current Level</i>												
New Revenues - Direct			1.4	3.6	6.4	7.4	8.0	8.1	7.2	7.1	9.5	9.3
New Revenues - Ind. and Ind.			2.6	6.8	12.1	14.0	15.0	15.3	13.6	13.3	17.9	17.4
New Revs. to State (est.)			2.2	5.7	10.1	11.6	12.5	12.7	11.3	11.0	14.9	14.5
New Revs. to Local (est.)			1.8	4.8	8.5	9.8	10.5	10.7	9.5	9.3	12.5	12.2
Total New Revenues			4.0	10.5	18.5	21.4	23.0	23.4	20.9	20.3	27.5	26.7
Gross Cost of Tax Credit			46.2	46.9	48.6	48.6	47.5	46.2	44.1	42.6	41.6	39.2

Note: Above tax revenue estimates are based upon results of coal producer survey and \$3.86/ton estimate of VCCER 95-1. Costs of current tax credit listed for years in which credit could be claimed. Costs of non-delayed, non-contingent credits listed for years in which coal is mined.

Table F-6. Summary of Southwest Virginia Coal Production Economic Impacts , with No Tax Credit

(All costs in Current Dollars).

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
SW Virginia Economic Impacts											
Coal Production (million tons)	37.3	36.0	34.8	33.9	33.3	32.4	30.9	30.2	29.4	27.2	25.8
Coal Revenues (\$ billion)	1.16	1.15	1.15	1.15	1.16	1.17	1.15	1.15	1.16	1.10	1.08
Average Price (\$/ton)	31.02	31.95	32.91	33.90	34.92	35.96	37.04	38.16	39.30	40.48	41.69
Total Business Revenues (\$ billion)	2.11	2.11	2.10	2.10	2.13	2.14	2.10	2.11	2.12	2.02	1.97
Employment (1000 jobs)											
Coal Mining Firms	8.1	7.8	7.5	7.3	7.2	7.0	6.7	6.5	6.4	5.9	5.6
Other Direct	2.5	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.0	1.9	1.8
Indirect and Induced	12.1	11.7	11.3	11.0	10.8	10.6	10.1	9.8	9.6	8.9	8.4
Total	22.7	22.0	21.3	20.7	20.3	19.8	18.9	18.4	18.0	16.6	15.8
Payroll (\$ million)											
Direct	424	424	422	423	428	430	423	425	427	407	398
Indirect and Induced	223	223	222	223	225	226	222	223	224	214	209
Total	647	648	645	646	653	656	645	648	651	621	607
Tax Payments (\$ millions)											
Direct	33	33	33	33	33	33	33	33	33	32	31
Indirect and Induced	12	12	12	12	13	13	12	13	13	12	12
Total Tax Collections	46	45	45	45	46	46	45	46	46	44	43
Coal Severance (@ 2%)	23	23	23	23	23	23	23	23	23	22	22
CEDA Contributions	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.7

Note: Coal prices projected from average 1994 basis, assuming real-dollar price remains constant and 3 percent annual inflation.

Table F-7. Summary of SW Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
SW Virginia Economic Impacts										
Coal Production (million tons)	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	1.2	0.6
Coal Revenues (\$ million)	4.6	10.6	11.3	12.4	13.5	16.0	17.9	20.0	49.2	23.6
Total Business Revenues (\$ million)	8	19	20	22	24	29	33	36	90	43
Employment (jobs)										
Coal Mining Firms	31	70	72	77	81	94	102	110	263	123
Other Direct	10	20	20	22	23	29	31	34	80	37
Indirect and Induced	47	103	106	113	119	140	152	164	393	183
Total	88	192	198	212	224	262	285	308	737	344
Payroll (\$ million)										
Direct	2	4	4	4	5	6	7	7	18	9
Indirect and Induced	1	2	2	2	3	3	3	4	9	5
Total	3	6	6	7	7	9	10	11	27	13
Fiscal Impacts(\$ thousands)										
New Revenues - Direct	132	300	318	350	382	458	512	570	1,405	675
New Revenues - Ind. and Ind.	50	112	118	130	142	173	193	215	530	254
Total New Revenues	182	411	436	480	524	631	705	785	1,935	930
Coal Severance (@ 2%)	93	211	226	248	270	321	358	399	983	473
CEDA Contributions	12	26	28	31	34	40	45	50	123	59

TableF-8. Summary of SW Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Double the Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
SW Virginia Economic Impacts										
Coal Production (million tons)	1.0	1.8	3.2	3.8	4.0	3.6	3.7	4.1	5.5	4.1
Coal Revenues (\$ million)	30.4	60.0	107.1	132.7	143.3	131.9	142.6	159.3	221.8	172.4
Total Business Revenues (\$ million)	55	109	194	240	260	239	258	289	403	313
Employment (jobs)										
Coal Mining Firms	206	395	684	823	863	771	810	878	1,187	896
Other Direct	62	117	204	245	257	229	241	262	357	269
Indirect and Induced	307	586	1,017	1,223	1,282	1,145	1,202	1,304	1,768	1,333
Total	575	1,098	1,906	2,291	2,402	2,145	2,252	2,444	3,312	2,497
Payroll (\$ million)										
Direct	11	22	39	48	52	48	52	58	81	63
Indirect and Induced	6	11	20	25	27	25	27	30	42	33
Total	17	33	59	73	79	73	79	88	123	96
Fiscal Impacts(\$ thousands)										
New Revenues - Direct	867	1,707	3,049	3,777	4,078	3,752	4,058	4,534	6,324	4,913
New Revenues - Ind. and Ind.	326	640	1,144	1,417	1,530	1,407	1,522	1,701	2,377	1,845
Total New Revenues	1,193	2,347	4,194	5,194	5,608	5,158	5,580	6,235	8,700	6,758
Coal Severance (@ 2%)	608	1,199	2,143	2,654	2,865	2,638	2,852	3,186	4,436	3,448
CEDA Contributions	76	150	268	332	358	330	357	398	555	431

Table F-9. Summary of SW Virginia Coal Production Economic Impacts: Estimates of Incremental Impacts of a Non-Delayed, Non-Contingent Tax Credit at Triple the Current Level. (Current Dollars).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
SW Virginia Economic Impacts										
Coal Production (million tons)	1.2	3.0	5.1	5.7	6.0	5.9	5.1	4.9	6.5	6.1
Coal Revenues (\$ million)	37.8	97.5	172.3	199.1	214.2	217.9	194.9	191.3	261.1	252.9
Total Business Revenues (\$ million)	69	175	310	358	385	392	351	347	474	459
Employment (jobs)										
Coal Mining Firms	256	641	1,101	1,235	1,290	1,274	1,107	1,055	1,397	1,314
Other Direct	78	186	317	356	372	367	323	314	420	395
Indirect and Induced	322	886	1,560	1,758	1,840	1,819	1,579	1,511	2,025	1,904
Total	656	1,713	2,977	3,349	3,501	3,460	3,008	2,879	3,843	3,614
Payroll (\$ million)										
Direct	14	35	62	71	77	78	70	69	95	92
Indirect and Induced	6	17	31	36	39	40	36	35	48	47
Total	20	52	93	108	116	118	106	104	144	139
Fiscal Impacts(\$ thousands)										
New Revenues - Direct	1,079	2,762	4,879	5,638	6,065	6,171	5,531	5,446	7,443	7,210
New Revenues - Ind. and Ind.	377	1,002	1,788	2,070	2,229	2,269	2,035	2,011	2,764	2,677
Total New Revenues	1,456	3,764	6,667	7,709	8,295	8,440	7,566	7,457	10,207	9,888
Coal Severance (@ 2%)	756	1,949	3,447	3,981	4,283	4,358	3,899	3,827	5,223	5,059
CEDA Contributions	95	244	431	498	535	545	487	478	653	632

OTHER VCCER PUBLICATIONS

The Virginia Center for Coal and Energy Research provides objective and factual information on energy issues of economic and environmental importance to the Commonwealth. Its mission is to conduct inter-disciplinary research into coal and energy issues, and to disseminate information on energy and energy-related research conducted both within and outside of Virginia Polytechnic Institute and State University.

For information regarding prices and availability of the following and other VCCER publications, call the VCCER Publications Office, (540) 231-6506, or write to VCCER, 617 North Main Street, Blacksburg, Virginia 24060-0411.

Periodicals

***Energy Outlook*, Quarterly.**

The mission of this quarterly, six-page newsletter is to disseminate coal- and energy-related news, information, and research results having a particular importance to the Commonwealth. With a current circulation of 3,600, ***Energy Outlook*** reports on research activities of VCCER staff, on research being conducted at Virginia Tech and other Virginia universities, on organizations within the state that focus on energy production, on legislation of special importance to the state's coal and energy industries, and on other energy-related topics. Four issues/year subscription.

***1995 Virginia Coal*, July 1995.**

Updated annually, this guide is a complete directory and data reference source for all mines licensed during the Commonwealth for 1994. Mine listings for each operation include company and mine name, location and contact person, coal owner, seam worked, employees, production, productivity, and mining equipment used. Other information contained in ***Virginia Coal*** includes state production data, county coal summaries, coal analyses, natural-gas production data, rail information and Hampton Roads coal-export information and service directories. The most complete catalog of its kind available anywhere in the state.

Research Reports

Economic Impacts of Virginia's Natural Gas Industries. Carl Zipper and Leonard Gilroy. 16 p. September 1995.

In-State Economic Impacts of the Virginia Coal Industry and Potential Coal Production Declines. Carl Zipper. 30 p. May 1995.

An Analysis of Household Water Supply Impacts by Underground Coal Mining in Virginia. Carl Zipper, William Balfour, John Randolph, and Richard Roth. 34 p. May 1994.

Assessment of Virginia Coalfield Region Capability to Support an Electric Power Generation Industry. Carl E. Zipper, Thomas K. Henritze, and John Randolph. 50 p. January 1994.

Virginia Coal: An Abridged History. Walter R. Hibbard; April 1990. 151 pp.

Virginia Energy Patterns and Trends: Virginia Energy Profiles 1960-1990. [1991 Edition.] John Randolph. August 1991.

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Effects of Virginia Coalfield Employment Enhancement Tax Credit Legislation is Virginia Tech publication no. VT/176/0396/100/962969.

