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Another Day Older and Deeper in Debt: How Tax Incentives Encourage Burning Coal and the Consequences for Global Warming

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*Roberta Mann**

You load sixteen tons, what do you get
Another day older and deeper in debt
Saint Peter don't you call me 'cause I can't go
I owe my soul to the company store[1]

I. INTRODUCTION

Where does the power come from when you flip on the light switch? Probably from the original fossil fuel—coal. Coal generates more than half of the electricity in the United States. Civilization has had a love-hate relationship with coal for centuries. Coal was the foundation of modern industrial society; it kept us warm, fired our factories, fed our trains, and lit our world. But coal made great cities filthy, and in one instance its smoke killed thousands of people in a single day.[2] Today, we don't have to think about the drawbacks of coal use when we turn on the lights. We can't smell or see the smoke caused by burning coal. Most of us have never even seen coal. Given the unpleasant and global consequences of coal use, however, it deserves more thought.

Coal usage is both a blessing and a curse. Our large domestic reserves of coal can produce the energy we need to live comfortable lives, and it appears to be the cheapest way of generating electricity. But it is the dirtiest fuel we have. Per unit of energy, coal appears to be the cheapest fuel. But while the nominal price we pay for coal-based energy reflects some of the cost of extracting, processing, transporting, and converting it to energy, it does not reflect the social and environmental costs of coal. Moreover, because coal is subject to tax subsidies, the price does not reflect the entire direct cost of coal. As long as coal appears to be the lowest cost alternative, however, its use will likely increase.

Why should American consumers and businesses be concerned about coal's low cost and continued dominance of the energy market? Because those same consumers and businesses will, sooner or later, be forced to pay the price for

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1. Merle Travis (Capitol Studios 1946).

2. London's last "killer fog" occurred in 1952. Over 4,000 people died. *See* http://www.nationalgeographic.com/eye/ozone/effect.html, (last visited Mar. 23, 2006).

continued use of "cheap" coal. As market forces will not account for the full cost of coal, the government should step in to correct this market failure. However, in the United States, the federal government has done just the opposite; it has encouraged the use of coal through significant tax incentives. The coal industry receives preferential treatment that amounts to the transfer of billions of dollars. The Energy Policy Act of 2005 maintains and increases these tax subsidies.

Coal's current low price is made possible by borrowing from the future. This borrowing creates two types of deficits: fiscal and environmental. The federal government is required to track the cost of certain tax benefits, so the cost to the fiscal deficit is readily quantifiable.[3] However, no law requires the government to calculate the environmental and social costs of coal. A number of private researchers, however, have created estimates.[4] Coal's hidden costs include the environmental degradation of coal mining communities, the health effects of coal mining suffered by miners, the toxic pollution resulting from burning coal that affects anyone within wind range, and the global consequences of greenhouse gas ("GHG") emissions. The negative consequences of burning coal have been known for many years, so why is coal the largest and still growing portion of our electricity generating fuel? The answer is that society is not paying for a large portion of coal's costs. We are, indeed, another day older and deeper in debt. The interest is compounding on our greenhouse debt: the more carbon in the air, the more global warming. Coal's impact on climate change might create a debt that cannot be repaid at any price. The government, both through regulation and the tax system, addresses some of the social and environment consequences of coal, but completely ignores greenhouse gas emissions. The burden of this market failure falls on the general public, and on businesses that generate or use electricity. International pressure has led some businesses to take action to limit greenhouse gas emissions. However, until the government adopts new policies, businesses are left in the precarious position of not knowing what the future landscape of emissions regulations will look like. This situation could discourage businesses from taking voluntary emissions reductions actions for fear they could be inconsistent with any future government regulation.

This article intends to clear up the smokescreen surrounding the government subsidy for coal use. The focus is on coal because it generates a majority of this nation's electricity. This article argues that choosing coal as the primary fuel to generate electricity constitutes a market failure. Tax policy can be used as a tool to correct market failure, but, in coal's case, tax policy exacerbates market failure by providing subsidies. To fully comprehend the ramifications of coal usage, there must be an understanding of coal's historical and current uses. This article will address the social and environmental costs of coal, including miners' health and safety, and pollution effects such as acid precipitation, mercury emissions,

3. JCT, Estimated Budget Effects of the Conference Agreement for Title XIII of H.R.6, the Energy Tax Incentives Act of 2005, JCX-59-05 (July 27, 2005).

4. *See infra* Pt. II.

particulate emissions, and greenhouse gas emissions. Next, this article will explore the tax treatment of coal, including the theoretical basis for coal depletion, exploration and development costs, reclamation costs, and the credit for synthetic fuels. The Energy Tax Incentives Act, the tax title of the Energy Policy Act of 2005, added significant benefits for coal use and production, including the renewable electricity production credit and the credit for investment in clean-coal facilities. Finally, this article will discuss how tax policy could improve coal use, focusing on how taxes may be used to account for coal's social and environmental costs, and why a carbon tax might be better for business than either ignoring greenhouse gas emissions or implementing a tradable permit system.

II. ABOUT COAL: PAST, PRESENT AND FUTURE

A. Past

People have used coal to generate heat for thousands of years. Archeologists found remains of coal fires in ancient Native American sites.[5] In the 5th century A.D., the Romans burned coal when they occupied what is now Great Britain.[6] The English began burning coal in the 13th century, after depleting most of their forests.[7] However, as the use of coal increased, people became increasingly offended by the unpleasant smell of the smoke. By 1306, King Edward I banned the use of coal.[8] This ban did not last. In the 16th century most Londoners used coal for home heating.[9] Blacksmiths and ironworkers also used coal for their forges.[10] The English first found coal on the banks of the Tyne River, near Newcastle.[11] After harvesting the coal on the surface, they dug mines.[12] As mines were dug deeper, they filled with water, making it increasingly difficult to extract the coal.[13] This difficulty led to the invention that helped bring about the industrial revolution. In 1699, Thomas Savery patented a coal-fired steam pump to remove the water from the mines.[14] For the first time, coal generated not just heat, but energy as well. James Watt improved this technology, making it more efficient, and created the steam engine.[15] The steam engine transformed society, making mass production and rapid transportation possible.

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5. PRISCILLA LONG, WHERE THE SUN NEVER SHINES 8 (Paragon House 1989), citing J.U. NEF, COAL MINING AND ITS UTILIZATION, IN A HISTORY OF TECHNOLOGY 72-74(1957).
6. BARBARA FREESE, COAL: A HUMAN HISTORY 15 (2003).
7. Freese, *supra* note 6, at 24.
8. *Id.* at 25.
9. *Id.* at 32 – 33.
10. Long, *supra* note 5, at 8.
11. Freese, *supra* note 6, at 22.
12. Long, *supra* note 5 at 9.
13. *Id.*
14. *Id.*
15. *Id.* at 10.

B. Present

Until 1870, the term "fossil fuel" referred exclusively to coal.[16] Between 1920 and 1950, coal lost its role as the primary source of household heat, commercial power, and transportation fuel.[17] Petroleum products replaced coal: diesel fuel for the railroads, fuel oil for heating homes.[18] But the total amount of coal used did not significantly decline. The use of coal shifted from direct heating and power to electricity generation. Thomas Edison built the first practical coal-fired electricity generating station in New York in 1882.[19] Since then, the use of coal for electricity generation continues to increase. In 1947, 17.4% of coal consumed in the United States generated electricity.[20] Fifty years later, in 1997, 89.4% of coal consumed in the United States generated electricity,[21] increasing to 91.9% in 2004.[22]

We continue to consume increasing amounts of coal. Coal use doubled from 1965 to 1995.[23] The Department of Energy expects coal use to triple over 1965 levels by 2025.[24] In 2004, over 1.1 billion tons of coal were burned in the United States.[25] Coal use is increasing for a number of reasons, but most notably because of the rise in electricity use. The factors contributing to increased electricity use include the trend towards living in larger homes; use of more electrically powered gadgets; and, the population shift to the warmer South and Southwest, resulting in greater use of air conditioning.[26]

Coal continues to be favored for electricity generation because the United States has significant domestic coal reserves—more so than any other nation.[27] The coal supply, because it is domestic, is not subject to the energy security concerns faced by oil. Moreover, it is relatively inexpensive relative to other energy sources. In 2004, the average price of generating a million British Thermal Units ("Btu") from coal was $1.39, as compared with $7.52 for natural gas and $12.61 for petroleum.[28] One short ton of coal generates, on average,

16. RICHARD GORDON, COAL IN THE U.S. ENERGY MARKET: HISTORY AND PROSPECTS 22 (1978).

17. *Id.*

18. MARTIN B. ZIMMERMAN, THE U.S. COAL INDUSTRY: THE ECONOMICS OF POLICY CHOICE 5 (1981).

19. Nat'l Energy Tech. Lab., *History of Coal Use*, http://www.netl.doe.gov/KeyIssues/secure_energy2a.html (last visited Mar. 25, 2006).

20. ENERGY INFORMATION ADMINISTRATION, Annual Energy Review 2004 at Table 7-3. [hereinafter "AER 2004"].

21. *Id.*

22. *Id.*

23. AER 2004, *supra* note 20, at Table 7-3.

24. ENERGY INFORMATION ADMINISTRATION, Annual Energy Review 2006, Table 1 at 11.

25. AER 2004, *supra* note 20 at Table 7-3.

26. ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2006 at 67 [hereinafter "*AEO 2006*"] (Residential Sector Energy Demand).

27. Nat'l Energy Tech. Lab., Realizing the Clean Energy Potential of Domestic Coal, http://www.netl.doe.gov/KeyIssues/secure_energy2a.html (last visited Mar. 25, 2006).

28. AEO 2006, *supra* note 26, Table A3, at 138.

20,754,000 Btus, or enough power to run one hundred 100-watt lightbulbs for 86.475 days.[29] As the electricity generation industry has been largely deregulated, cost of fuel assumes greater importance.[30] Although no new coal plants have been built over the past thirty years, utility companies in the United States propose to build over 150 coal fired plants in the future, most using conventional coal burning technology.[31]

Although coal is inexpensive, coal-fired electricity generation is extremely inefficient. The coal fuel cycle involves the following steps: mining, coal preparation, transportation from the mine to the power plant, electricity generation, electricity transmission, and waste disposal.[32] Conventional "subcritical" coal-to-steam power plants operate at an average 25% overall efficiency.[33] That is, three-quarters of the energy in coal is lost to processing, transportation, and waste heat.[34] Many authorities discuss the efficiency of power plants by measuring only the thermal efficiency, which excludes losses from transportation and processing of coal prior to combustion.[35]

Currently available advanced technology can increase the thermal efficiency. Subcritical plants, using pulverized-coal combustion, operate at thermal efficiencies of between 30-36%.[36] Supercritical plants, using pressurized fluid-bed combustion, operate at thermal efficiencies from 43-45%.[37] Integrated gasification combined cycle (IGCC) plants could operate at up to 45% efficiency, but the two IGCC plants currently operating the United States achieve only 38-

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29. Discussing energy can be a lot like trying to comparison shop at the grocery store. One brand of paper towels is priced per 100 sheets; the next is priced by weight. A "Btu," or British Thermal Unit, is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. One *kilowatt-hour* of electricity is 3,412 Btu. A kilowatt-hour is the amount of energy expended by a one kilowatt device over the course of one hour. A kilowatt is 1,000 watts. One *watt* is one *joule* of energy per second. One joule is the absolute minimum amount of energy required (on the surface of Earth) to lift a one kilogram object up by a height of ten centimeters. A *gigawatt* is 1,000,000,000 watts. A *megawatt* is 1,000,000 watts. A *short ton* is 2,000 pounds.

30. Regulated energy providers are generally required to practice demand-side management. Under deregulation, this requirement is frequently dropped. As revenues depend on the amount of energy sold, providers have an incentive to sell more energy and to generate it as cheaply as possible. EIA, Electric Power Annual Report 2004 4 (2005). One commentator notes: "[P]rice is even more important to achievement of energy efficiency in a deregulated market than it is in a regulated market. To the extent that prices do not reflect social cost, or to the extent that information and transaction costs impede the functioning of markets, energy efficiency will be even harder to achieve in a competitive market than it was in a monopolized market." *Energy Efficiency in Deregulated Markets*, 14 YALE STUDENT SCHOLARSHIP SERIES 31 (2005).

31. Susan Moran, Coal Rush, World Watch 8 (Jan./Feb. 2007).

32. Oak Ridge National Laboratory, Report 3: Estimating Externalities of Coal Fuel Cycles 1-9 (1994).

33. RICHARD DORF, TECHNOLOGY, HUMANS, AND SOCIETY: TOWARD A SUSTAINABLE WORLD 261 (Academic Press 2001)

34. CANADIAN ENERGY RESEARCH INSTITUTE, ELECTRICITY GENERATION TECHNOLOGIES: PERFORMANCE AND COST CHARACTERISTICS 34 (2005) [hereinafter "*CERI*"].

35. *See, e.g.* IAN M. TORRENS & WILLIAM C. STENZEL, INDUSTRY PERSPECTIVES ON INCREASING EFFICIENCY OF COAL-FIRED POWER GENERATION (1997), *available at* http://www.netl.doe.gov/publications/proceedings/97/97cct/cct _pdf/97CCP1_2.PDF (last visited Mar. 25, 2006.)

36. *CERI*, *supra* note 34, at 36.

37. *Id.*

39.7% efficiency.[38] Increasing efficiency would reduce the environmental consequences of coal use by reducing emissions.

C. Future

The Energy Information Administration anticipates that coal will provide 59% of our electricity by 2030.[39] The agency predicts an increase of 174 gigawatts of coal-fired generating capacity between 2004 and 2030.[40] GHG emissions are projected to increase significantly as well, from 5,900 metric tons in 2004 to 8,114 million metric tons in 2030.[41] Eleven conventional coal plants proposed in Texas alone will emit 78 million tons.[42]The increase in GHG emissions occurs even as primary energy consumption decreases, because of a proportionately higher use of coal for electricity generation.[43] A higher proportion of that coal is also anticipated to be Western, or subbituminous coal.[44] Different types of coal have different energy and carbon contents. However, any type of coal produces significantly more GHG emissions than oil or natural gas. On average, use of coal for energy generation emits 23% more carbon than oil, and 76% more carbon than natural gas.[45] There are four types of coal: anthracite, bituminous, subbituminous, and lignite. Anthracite has the highest carbon content, between 86% and 98%, and the highest heat value, of about 15,000 BTU per pound.[46] Anthracite is the smallest part of the coal mix used in the electric power industry.[47] Lignite, which represents less than 10% of the coal used for power generation, has a carbon content between 25% and 35%, and a heat value of 4,000 to 8,300 BTU per pound.[48] Bituminous coal has a carbon content of between 45% and 86% and a heat value of 10,500 to 15,500 BTU per pound.[49] Bituminous coal is generally found east of the Mississippi River. Subbituminous coal, found in the Western part of the United States, has a lower carbon content than bituminous coal (between 35% and 45%), but because it also has a lower heat value (between 8,300 and 13,000 BTU per pound), using subbituminous

38. *Id.* at 47; REVIEW OF POTENTIAL EFFICIENCY IMPROVEMENTS AT COAL-FIRED POWER PLANTS (2001), *available at* http://www.epa.gov/airmarkets/fednox/126noda/heatrate_rpt_april17.pdf .

39. *AEO 2006 supra* note 24, at Table A8 at 147.

40. *Id.* at 7.

41. *Id.* at 10.

42. Moran, supra note 31 at 9.

43. *AEO 2006, supra* note 24, at 10.

44. *Id.* at 98.

45. DEPT. OF ENERGY & E.P.A., CARBON DIOXIDE EMISSIONS FROM THE GENERATION OF ELECTRIC POWER IN THE UNITED STATES 3 (July 2000), *available at* http://www.yosemite.epa.gov/oar/globalwarming.nsf/content/Resource CenterPublicationsGHGemissions.html.

46. American Coal Foundation, *Types of Coal, available at* http://www.ket.org/trips/coal/agsmm/agsmmtypes.html.

47. EIA Electric Power Annual 2004, Table 4.6, at 31.

48. *Id.*; American Coal Foundation, *supra* note 46,

49. American Coal Foundation, *supra* note 46.

coal for electricity generation emits more GHG than using bituminous coal.[50] Subbituminous coal emits 212.7 pounds of carbon dioxide per million BTU. Bituminous coal emits 205.3 pounds of carbon dioxide per million BTU.[51] Due to environmental regulations restricting sulfur emissions,[52] the proportion of subbituminous coal used for electricity generation has increased.[53] In 1994, less than 36% of the coal used for electricity generation was subbituminous.[54] In 2004, over 46% of the coal used for electricity generation was subbituminous, exceeding the amount of bituminous coal used for the first time.[55] The Department of Energy expects this trend to continue, predicting that by 2030 almost 63% of coal production will be Western coal.[56]

Of the predicted increased capacity in coal-fired electricity generation, 19 gigawatts are expected to come from coal-to-liquid (CTL) plants. The Department of Energy predicts that 55% of the new coal-fired capacity will be in more efficient IGCC plants.[57] While advanced coal technologies are designed to reduce sulfur and mercury emissions, reduction in carbon emissions would be a coincidental benefit of increased efficiency. One study estimates an 8% reduction in carbon emissions for supercritical versus subcritical technology, and a 15% reduction for ultrasupercritical technology.[58]

CTL and IGCC plants also have the capability of capturing greenhouse gases from the production process.[59] Conventional coal powered plants simply burn coal: there is no practical way to separate the carbon dioxide from the other by-products of combustion.[60] Although carbon dioxide ("CO_2") can be removed post-combustion, it results in a large decrease in plant efficiency.[61] IGCC plants don't burn coal: they convert coal into a synthetic liquid or gas, which is then burned. CO_2 and other pollutants separate out at the gasification stage, before combustion, and can be relatively easily removed with little impact on efficiency.[62]

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50. *Id.*

51. B.D. Hong and E. R. Slatick, Carbon Dioxide Emission Factors for Coal, *Quarterly Coal Report, January-April 1994*, DOE/EIA-0121(94/Q1) (Aug. 1994), at 1-8, *available at* http://www.eia.doe.gov/cneaf/coal/quarterly/co2_article/co2.html.

52. In March 2005, the E.P.A. promulgated new regulations to control sulfur emissions, called the Clean Air Interstate Rule, or "CAIR." *See* 40 C.F.R. § 72 et seq (2007). CAIR continues and strengthens the pre-existing cap-and-trade system.

53. EIA Annual Energy Outlook 2006 at 98, *available at* http://www.eia.doe/oiaf/aeo/electricity.html.

54. Electric Power Annual 2004, Table 4.6 at 31.

55. *Id.*

56. Annual Energy Outlook 2006, *supra* note 53, at 98.

57. *Id.* at 101.

58. Torrens & Stenzel, *supra* note 35 at 11.

59. JEFF GOODELL, BIG COAL: THE DIRTY SECRET BEHIND AMERICA'S ENERGY FUTURE at 219 (2006).

60. Goodell, *supra* note 59, at 211.

61. Environmental Footprints and Costs of Coal-Based Integrated Gasification Combined-Cycle and Pulverized-Coal Technologies, EPA-430/R-06/006 5-5 (July 2006), *available at* http://www.epa.gov/airmarkets/articles.control.html, last visited Aug. 8, 2006.

62. Environmental Footprints, *supra* note 61, at 5-10.

The additional cost of CO_2 removal ranges from $300 to $500 per kilowatt ("kW") for existing IGCC plants, and $800 per kW for conventional pulverized coal plants.[63] If CO_2 removal costs were reflected in the cost of energy, it would reduce or even eliminate the cost advantage of building cheaper conventional coal plants.

A new study by researchers at the Massachusetts Institute of Technology examines the future of the coal industry in a "carbon-constrained world."[64] The researchers concluded that market adoption of carbon capture and sequestration (CCS) "requires the incentive of a significant and widely applied charge for CO2 emission. [65] The researchers estimated that a CO2 emissions charge of $30 per ton would be sufficient to make new coal plants with CCS competitive with new coal plants without CCS.[66]

III. COAL'S EXTERNAL COSTS

Electricity users may not be aware of coal's environmental effects; they simply want electricity on demand and at a reasonable price. When coal was used as a direct heating source, everyone could see and smell the noxious smoke emanating from their homes. Today, the environmental consequences of coal use tend to be insidious. Users may not be located near the power plant. They may not notice the slow decline of native trees and wildlife, or they may not attribute it to coal use. A user might not think that her child's asthma could be aggravated by a coal-burning power plant fifty miles away. But using coal to generate electricity imposes significant costs on society, from acid precipitation to mining accidents. The full social cost of any good or service consists of two components: price and external costs. The price reflects the "internalized" costs, that is, those borne by the producer and passed on to the consumer. Internalized costs reflected in price may include labor, capital, insurance and taxes. If the external costs of coal are not reflected in the price, absent governmental correction, the market will demand more coal than economically optimal. The solution is to make alternative sources of energy more attractive with subsidies or to make coal more expensive with taxes.[67]

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63. *Id.* at 5-13.

64. JOHN DEUTCH & ERNEST J. MONIZ ET AL., THE FUTURE OF COAL: OPTIONS IN A CARBON-CONSTRAINED WORLD, MASS. INST. OF TECH. (2007) (hereinafter "*MIT Study*"), *available at* http://web.mit.edu/coal/, last visited Apr. 4, 2007.

65. *Id.* at 15.

66. *Id.* at 91.

67. TODD L. CHERRY & JASON F. SHOGREN, THE SOCIAL COST OF COAL: A TALE OF MARKET FAILURE AND MARKET SOLUTION 4 (2002), *available at* http://www.business.appstate.edu/departments/economics/papers/wp0105.pdf.

A. Worker Health and Safety

Coal miners are well aware of coal's costs. Coal may be extracted by underground mining or surface mining. Underground mining accounts for 38% of the coal mined; surface mining accounts for 62% of the coal mined.[68] Miners face greater risks from underground mining, which is more labor intensive than surface mining.[69] Although safety records for underground mines have improved significantly over the past century, tragic accidents still occur.[70] Miners also experience increased risk of disease from exposure to coal dust and radon.[71] A study conducted in 1974 estimated that 1 in 10 miners would die from black lung disease.[72] However, on a purely economic level, the costs of black lung disease are at least partially internalized through workers' compensation and benefits and the black lung excise tax.[73]

B. Direct Environmental Impact of Mining Activity

Mining also harms the environment surrounding a mine. By its nature, surface mining alters the physical landscape—removing vegetation and topsoil and rendering the downslope environment vulnerable to floods.[74] Mountaintop removal, a type of surface mining, can fill entire valleys, completely altering the watershed, and destroying habitat for plants and animals. Mine drainage can be acid or alkaline, and in either case damages aquatic life in adjacent streams.[75] The environmental effects of underground mines, although less visible, can be just as devastating. In 1962, the anthracite mine under Centralia, Pennsylvania, caught on fire when a town dump burned.[76] Over forty years and millions of dollars later, with almost the entire town evacuated after carbon monoxide and ground collapse threatened the lives of residents, the mine continues to burn.[77]

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68. PAMELA L. SPATH, MARGARET K. MANN AND DAWN R. KERR, LIFE CYCLE ASSESSMENT OF COAL-FIRED POWER PRODUCTION 15, NREL/TP-570-25119 (National Renewable Energy Laboratory 1999).

69. Oak Ridge National Laboratory, *supra* note 32, at 8-7.

70. *See, e.g.*, Pitts, *Breakdown at Sago: Trouble and Tragedy Two Miles In*,. POST-GAZ at B-1 (Jan. 15, 2006).

71. Oak Ridge National Laboratory, *supra* note 32, at 8-11, 8-15.

72. *Id.* at 8-17.

73. IRC § 4112 (2007). The rates: $1.10 per ton for coal from underground mines and $0.55 per ton for coal from surface mines.

74. SPATH, ET. AL., *supra* note 68, at 16.

75. Oak Ridge National Laboratory, *supra* note 32, at 8-20.

76. DAVID DEKOK, UNSEEN DANGER: A TRAGEDY OF PEOPLE, GOVERNMENT, AND THE CENTRALIA MINE FIRE 23 (1986).

77. AP, *State ends relocation for people over Centralia mine fire*, http://www.post-gazette.com (Jan. 1, 2006).

C. Indirect Pollution Effects of Coal Use

Dramatic as the direct impacts of coal mining are, the indirect pollution caused by coal use affects a much broader range of people and environments. Toxic pollutants emitted by coal-fired power plants include sulfur dioxide, particulates and mercury. To the extent that emissions of such pollutants are subject to regulation, the cost is internalized into the price of coal.

1. Sulfur dioxide

Coal-fired power plants are the largest source of sulfur dioxide, accounting for nearly two-thirds of all U.S. emissions.[78] Sulfur dioxide and nitrogen oxides react with water and oxygen in the atmosphere to form acidic compounds, which fall to Earth in the form of acid precipitation. Acid precipitation affects aquatic ecosystems, and those animals that depend upon aquatic ecosystems for food. The case of sulfur dioxide emissions is a success story for market-based pollution controls. The Clean Air Act's sulfur dioxide trading system has been credited with a substantial decrease in sulfur emissions.[79] Utility companies have a choice of methods for complying with the emissions requirements, including installing glue gas desulfurization equipment, commonly referred to as scrubbers, purchasing additional tradable allowances, or fuel switching or blending (using a cleaner fuel or choosing lower sulfur coal). New regulations promulgated by the Environmental Protection Agency in 2005 integrate sulfur dioxide reductions with nitrogen oxide and particulate reductions.[80] One commentator has noted a potentially perverse consequence of the new rules: the Clean Air Interstate Rule (CAIR) requires a dramatic reduction in the sulfur dioxide emissions cap beginning in 2010, resulting in a devaluation of new allowances but preserving the value of vintage allowances.[81]

2. Mercury

Coal-fired power plants are the largest source of mercury air emissions in the United States.[82] The costly health effects of mercury emissions are substantial: one study concluded that mercury toxicity attributable by U.S. power plant emissions results in a loss of intelligence in exposed children resulting in lost

78. Patricia Glick, *The Toll from Coal: How Emissions from the Nation's Coal-Fired Power Plants Devastate Wildlife and Threaten Human Health* , 4, http://www.nwf.org.

79. Environmental Defense Fund, http://www.environmentaldefense.org/documents/2695_cleanairact.htm (sulfur dioxide emissions reduced 27 percent from 1970 to 2000.)

80. Clean Air Interstate Rule (CAIR), 70 Fed. Reg. 25162, 25195 (May 12, 2005).

81. Jacob Kreutzer, *Note: Cap And Trade: A Behavioral Analysis of The Sulfur Dioxide Emissions Market*, 62 N.Y.U. ANN. SURV. AM. L. 125, 143 (2006).

82. James E. McCarthy, *Mercury Emissions from Electric Power Plants: An Analysis of EPA's Cap-and-Trade Regulations*, Cong. Res. Serv. Rep. No. RL32868 2 (2005).

productivity costs of $1.3 billion per year.[83] Another study found that the benefits of reducing power plant mercury emissions to 15 tons per year range from $119 million annually if persistent intelligence deficits from fetal exposures to mercury are counted, to as much as $5.2 billion annually if intelligence deficits, cardiovascular effects and premature mortality are included.[84] Mercury emissions were unregulated until 2005, when the Environmental Protection Agency promulgated the Clean Air Mercury Rule (CAMR).[85] CAMR uses a "cap-and-trade" mechanism, similar to sulfur dioxide rules. Critics note that mercury, a long-lasting neurotoxin, may not be adequately controlled using a cap-and-trade mechanism, which may produce environmental "hot spots."[86]

3. Greenhouse Gas Emissions

The impact of coal on climate change is more subtle, but no less serious. Coal is a fossil fuel, like oil and gas, and like those fossil fuels, it produces carbon emissions when burned. Coal produces more GHG emissions per Btu than any other fossil fuel.[87] GHGs increase global temperatures by acting like a blanket around the earth, preventing the sun's warmth from dissipating into space.[88] Scientists agree that man-made GHG emissions have lead to increased warming of the earth,[89] with consequences like glacial melting, increased severe weather, and a higher prevalence of tropical diseases.[90] Increasing GHG concentrations may lead not only to gradual warming, but to sudden climate shifts. One trigger of sudden climate change could be the collapse of the Gulf Stream.[91] The Gulf Stream is the fastest ocean current in the world, and it generally operates by absorbing heat from the sun in the mid-Atlantic, then distributing the heat to the North Atlantic. After releasing the heat in the North

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83. Leonardo Trasande, Philip J. Landrigan, Clyde Schechter, *Public Health and Economic Consequences of Methylmercury Toxicity to the Developing Brain,* ENVIRONMENTAL HEALTH PERSPECTIVES, 6 (Feb. 28, 2005) *available at* http://ehp.niehs.nih.gov/members/2005/7743/7743.pdf.

84. Glenn Rice and James K. Hammitt, Harvard Center for Risk Analysis, "Economic Valuation of Human Health Benefits of Controlling Mercury Emissions from U.S. Coal-Fired Power Plants," report for Northeast States for Coordinated Air Use Management, February 2005, http://bronze.nescaum.org/airtopics/mercury/rpt050315mercuryhealth.pdf],pp. xvi-xix.

85. 40 C.F.R. §§ 60 et seq. *See also* http://www.epa.gov/air/mercuryrule/basic.htm.

86. *See, e.g.*, Robert B. McKinstry Jr., *Putting the Market to Work for Conservation: The Evolving Use of Market-Based Mechanisms to Achieve Environmental Improvement In and Across Multiple Media,* 14 PENN ST. ENVTL. L. REV. 151, 159 (2006).

87. TIM FLANNERY, THE WEATHER MAKERS: HOW MAN IS CHANGING THE CLIMATE AND WHAT IT MEANS FOR LIFE ON EARTH 70 (2005) (noting that coal is almost pure carbon).

88. UNDERSTANDING CLIMATE CHANGE: A BEGINNER'S GUIDE TO THE UN FRAMEWORK CONVENTION AND ITS KYOTO PROTOCOL5-6.

89. Naomi Oreskes, *BEYOND THE IVORY TOWER: The Scientific Consensus on Climate Change,* 306 SCIENCE 5702, 1686 (2004).

90. *See* Roberta F. Mann, *Waiting to Exhale: Global Warming and Tax Policy,* 51 AM. UNIV. L. REV. 1135, 1143 (2002).

91. Flannery, *supra* note 87, at 190 – 196.

Atlantic, the cooler water sinks and flows back South. Should the Atlantic should become less salty, due to glacial melting, it will not sink in the North and the flow of the Gulf Stream would cease, resulting in abruptly lowered temperatures in Northern Europe and changes in rainfall. Other catastrophic events that may result from increased GHG concentrations are the collapse of the Amazon rain forest and methane release from the sea floor.[92]

GHG emissions from coal-fired power plants are entirely unregulated at the federal level, although several state and regional initiatives exist.[93] For example, the Regional Greenhouse Gas Initiative is an agreement between seven Northeastern states to create a mandatory cap-and-trade program to limit GHG emissions.[94] The participating states are Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. The program, as described in a memorandum of understanding signed by the states in December 2005, applies to fossil fuel-fired electricity generators 25 megawatts or greater, beginning in 2009. Regional emissions would be capped at 121.3 million short tons of CO_2 through 2014, and reduced to 10% below that level by 2018.[95] In another regional development, the Governor of California, Arnold Schwarzenegger, recently met with the prime minister of Great Britain, Tony Blair, to discuss solutions for global warming.[96] They entered into an agreement to speed the transition to a low-carbon economy by sharing best practices on emission trading and economic data, and to collaborate on technological research.[97]

This patchwork of state and regional initiatives poses a compliance challenge for business. Businesses make varied responses to the threat of global warming and the complexity of multi-jurisdictional rules. While some businesses have sought to deny the existence of global warming, a growing number of businesses are realizing the risks inherent in ignoring climate change.[98] The Carbon Trust, a British quasi-governmental entity, identified three types of climate change risk: regulatory risk, physical risk and business risk.[99] Power generators and users are subject to regulatory risk because government may impose regulations limiting

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92. Flannery, *supra* note 87, at 196 – 201.

93. Six regions are working on climate change policy, *See* Learning from State Action on Climate Change, June 2006 Update, *available at* http://www.pewclimate.org.

94. *See* http://www.rggi.org/.

95. *Id.*

96. Steve Howard, Arnold Schwarzenegger, Tony Blair, Gov. Schwarzenegger, British Prime Minister Tony Blair Sign Historic Agreement to Collaborate on Climate Change, Clean Energy, (July 31, 2006) (transcript available at http://gov.ca.gov/index.php/speech/2918/).

97. *Id.*

98. Flannery, *supra* note 87, at 242-43 (discussing the collapse of the Global Climate Coalition, an industry lobby group founded by fifty large companies in 1989 to cast doubt on the theory of global warming. The Coalition collapsed in 2000, after defections of most of the participants: businesses who realized that denial was no longer a viable option).

99. The Carbon Trust, *Brand value at risk from climate change* at 1 (Nov. 15, 2005), *available at* http://www.carbontrust.co.uk.

emissions.[100] Insurance companies and property owners are subject to the physical risk of flooding and property damage due to the rise of the sea level or violent weather patterns caused by climate change.[101] Regulatory and physical risk impact a broad sector of the economy. Business risk includes changing demand for a company's products or a changing competitive landscape.[102] Ultimately, all businesses will face risk from climate change, and some are taking action now. Wal-Mart announced that it would double the efficiency of its 7,000 truck fleet by 2016 and design a new prototype store that would reduce GHG emission by 25 percent.[103] BP receives high marks from institutional shareholders for its actions on climate change.[104] GE launched its "Ecomagination" strategy, planning to cut its GHG emissions and invest in clean technologies.[105] The World Bank Group became "carbon-neutral" by purchasing renewable energy certificates and 59,400 metric tons of carbon dioxide equivalent in verified emissions reductions (VERs) from projects in developing countries.[106] DuPont reported saving $2 billion by increasing the energy efficiency of its operations.[107] One corporation, Entergy, even joined 12 states in suing the Bush administration over its refusal to regulate climate change.[108]

Taking action against climate change could help businesses attract customers and retain customer loyalty. The Carbon Trust also studied how a company's response to climate change might affect its brand value.[109] The study examined six industries in Great Britain: airlines, oil and gas, food and beverage production, food retail, telecommunications, and banking.[110] The study found that the top three affected industries in terms of monetary impact would be food production, banking, and oil and gas.[111] In the case of food production, consumers can easily switch brands to the most climate friendly brand.[112] Food producers also face long-term potential supply chain risks, due to weather disruptions

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100. *Id.*

101. *Id.*

102. *Id.* at 3.

103. Michael Grunwald, Warming to the Inconvenient Facts: a political climate change could be in the works, WASH. POST. WEEKLY 23 (July 31, 2006).

104. Alan Murray, Frustrated Greens Turn to Boardrooms, WALL ST. J.at A2 (June 7, 2006). *See also* BP's website on its carbon reduction activities, listing sustainable energy projects, *available at* http://www.bp.com/sectiongenericarticle.do?categoryId=9008205&contentId=7015200

105. Can business be cool?, Economist.com (June 8, 2006), *available at* http://www.economist.com/business/. *See also* GE's Ecomagination website at http://ge.ecomagination.com/.

106. World Bank Goes Carbon-Neutral, Greenbiz.com (June 5, 2006), *available at* http://www.greenbiz.com/news/news_third.cfm?NewsID=31240&CFID=14238342&CFTOKEN=22833672.

107. The Climate Group, Carbon Down, Profits Up, Emissions Reductions: Leading Corporations, updated Aug. 30, 2004, *available at* www.theclimategroup.org/assets/Carbon_Down_Profit_Up.pdf.

108. Grunwald, *supra* note 103, at 23.

109. Carbon Trust, *supra* note 99.

110. *Id.* at 4.

111. *Id.* at 6.

112. *Id.* at 7.

potentially affecting raw materials.[113] Banks have strong indirect exposure to climate change risk, through the potential financial impact of climate change on those that they may lend to or invest in—from homeowners with mortgages who now live on flood plains, to manufacturers exposed to emissions regulation, to renewable energy projects seeking finance.[114] If a bank's customers do not believe that the bank is accurately assessing and managing this indirect risk, its brand value will suffer.[115] In 2005, HSBC became the first big bank to become carbon-neutral.[116] The study also found significant brand value risk in the oil and gas industry.[117] The Carbon Trust concluded that industry response to climate change could become a significant consumer issue within five years.[118]

The current regulatory approach in the United States may ultimately cost carbon-emitting electricity companies dearly. One commentator suggests that the recent proposed building boom in conventional coal plants is an effort to beat the clock on carbon restrictions.[119] A coalition of investors, power companies, and environmental groups have concluded that controlling sulfur dioxide, nitrogen oxide and mercury first, and adding carbon dioxide controls later, would be more expensive than controlling carbon dioxide at the same time as the other pollutants.[120] The coalition further concluded that financial markets would impose a penalty because electric companies cannot accurately value their assets when they cannot determine the future price of carbon dioxide emissions.[121] For this reason, as well as compliance concerns, at least one electric company advocates imposing a federal carbon tax.[122] Another company, while not going so far as to advocate a particular carbon reduction instrument, noted that "the answer to this problem is not 50 different approaches to greenhouse gases in the United States. That makes no sense at all."[123]

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113. *Id.* at 15.

114. *Id.* at 16.

115. *Id.*

116. Can Business Be Cool?, Economist.com (June 8, 2006)

117. Carbon Trust, *supra* note 99, at 16. See also BP's website, supra note 104, discussing BP's carbon reduction efforts.

118. Carbon Trust, *supra* note 99, at 3.

119. See Moran, *supra* note 31, at 10.

120. "For most electric power companies, it may be more cost-effective if standards for all four emissions are established at the same time." Coalition for Environmentally Responsible Economies (CERES), ELECTRIC POWER, INVESTORS, AND CLIMATE CHANGE: A CALL TO ACTION 9 (2003).

121. *Id.*

122. Duke Energy's chief financial officer, Paul Anderson, advocates a national carbon tax. He also testified before the President's Tax Reform Panel. http://sfgate.com/cgi-bin/article.cgi?file=/n/a/2005/04/07/financial/f081527D92.DTL (dukeenergycarbontax.pdf) The role of a federal carbon tax will be discussed at 26-31, *infra*.

123. Juliet Eilperin, Weary of Washington's Hot Air: State and local officials launch their own initiatives aimed at reducing greenhouse gases, WASH. POST WEEKLY at 29 (Aug. 21, 2006) (quoting Robert E. Busch, PSEG Services Corp. president).

Professor Perry Wallace has explored the effect of business' climate change response on the liability of corporate boards and officers.[124] He notes that shareholder proposals submitted to a number of public companies assert that management has a fiduciary duty to assess and disclose to shareholders all pertinent information on significant risks associated with climate change. The Ford Motor Company responded to one such shareholder proposal with a report dedicated to the issue of climate change.[125] Wallace concludes that both traditional laws on fiduciary duty, such as the business judgment rule and securities laws on environmental disclosure, as well as ethics, may apply to climate change issues.

The preceding discussion identifies those that may lose as a result of the United States' current policy of ignoring climate change. The big winner of the current policy is the fossil fuel industry, known to some commentators as "Big Oil" and "Big Coal."[126] One journalist called climate change "the preeminent case study of the contamination of our political system by money."[127] The journalist, Ross Gelbspan, credits large financial contributions by coal companies for President George W. Bush's electoral win in West Virginia; a state that no Republican Presidential candidate had ever won.[128] The coal companies reaped the benefits of their investment when President Bush reneged on his campaign promise to limit power plant emissions, withdrew from consideration of the Kyoto Protocol, and allowed coal companies unprecedented influence on Vice President Dick Cheney's Energy Task Force.[129] Another journalist, Jeff Goodell, also identifies Big Coal as a winner, noting that among top industrial political contributors, West Virginia coal-mining company Peabody Energy gave the highest percentage of its revenues (over five percent) to Republican candidates.[130] He notes that the Bush administration staffed regulatory agencies with former coal industry executives and lobbyists.[131] The Energy Policy Act of 2005 is the ultimate return on investment for the fossil fuel industry's support of the current administration. But as the next section illustrates, coal benefited from the tax system long before 2005.

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124. Perry Wallace, Professor, American University, Presentation at the University of the Pacific, McGeorge School of Law Symposium: Climate Change and Corporate Duties and Liabilities: The Effects of Emerging Law and Science (Feb. 24, 2006).

125. Ford Report on the Business Impact of Climate Change, *available at* www.ford.com.

126. *See* ROSS GELBSPAN, BOILING POINT: HOW POLITICIANS, BIG OIL AND COAL, JOURNALISTS, AND ACTIVISTS HAVE FUELED THE CLIMATE CRISIS—AND WHAT WE CAN DO TO AVERT DISASTER (2004) and JEFF GOODELL, BIG COAL: THE DIRTY SECRET BEHIND AMERICA'S ENERGY FUTURE (2006).

127. GELBSPAN, *supra* note 126, at 38.

128. *Id.* at 43–44.

129. *Id.* at 44–45.

130. Goodell, supra note 126 at xviii.

131. *Id.* at xvii.

IV. TAXATION OF COAL

Coal, like other fossil fuels, benefits from preferential tax treatment. Energy-related income tax preferences accounted for about $4.18 billion in fiscal year 2003 outlay equivalent estimates; more than the total estimated budget authority of $2.39 billion for energy supply programs.[132] The burden of special tax savings for the coal industry is borne by all taxpayers, much like the burden of environmental damage is borne by all affected communities and habitats. The cost of environmental damage caused by coal may be hard to quantify, but the tax savings received by coal and coal investors are tracked by the federal government.

Congress requires the Joint Committee on Taxation to publish annually the "tax expenditure budget," which tracks transfers of funds through the tax system. Congress requires tracking tax expenditures because benefits received by a taxpayer through a special departure from a "normal" income tax system are economically equivalent to a direct transfer of government funds to that taxpayer.[133] The Joint Committee uses its judgment to define what tax provisions are included in the "normal" tax system, using "a broad definition of income that is larger in scope than 'income' as defined by general U.S. tax principles."[134]

To determine preferential tax treatment, this article cleaves more closely to the definition of "income" as defined by general U.S. tax principles. This permits easier comparisons between the benefits coal receives and the benefits other (non-fossil fuel) businesses receive. This article assumes the following for its definition of income:

1. Income from any source is included in gross income.[135]
2. Income is "ordinary" unless it is derived from the sale or exchange of a capital asset.[136]
3. If the taxpayer is an individual, long-term capital gain is taxed at a lower rate than ordinary income.[137]
4. Deductions are a matter of legislative grace.[138]
5. Business deductions are permitted if they are ordinary and necessary expenses incurred during the taxable year in carrying on a trade or business.[139]

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132. GAO, *National Energy Policy: Inventory of Major Federal Programs and Status of Policy Recommendations*, GAO-05-379, at 7 (June 2005).

133. Congressional Budget and Impoundment Act of 1974, Pub. L. No. 93-344. *See, e.g.*, Jt. Comm. Tax'n, Estimates of Federal Tax Expenditures 2006–2011, JCS-2-06 (Apr. 25, 2006).

134. Estimates of Federal Tax Expenditures, *supra* note 133, at 2.

135. I.R.C. § 61 (2007).

136. I.R.C. § 1222 (2007).

137. I.R.C. § 1(h) (2007). The Joint Committee treats the lower rates enjoyed by long-term capital gains as tax expenditures. Estimates of Federal Tax Expenditures, *supra* note 133, at 5.

138. New Colonial Ice Co. v. Helvering, 292 U.S. 435, 440 (1940).

139. I.R.C. § 162(a) (2007).

6. If a business asset has a useful life of more than one year, generally the cost of such asset must be recovered via depreciation deductions over the life of the asset.[140]
7. Accelerated depreciation is usually available for business assets, but the total amount of depreciation may not exceed the cost of the asset.[141]

There are four ways that an industry or activity can receive preferential tax treatment:

1. The income from the activity can be excluded from gross income.[142]
2. The income from the activity can be taxed at a lower rate than ordinary income.[143]
3. Expenses from the activity can reduce income more or more quickly than expenses from other activities.
4. Expenses from the activity may be eligible for a tax credit – that is, a direct reduction in tax liability.[144]

These categories are derived from what the article will refer to as the "taxing equation," the graphic illustration of tax liability. The taxing equation is: [(Gross Income - Deductions) Tax Rate] - Tax Credits = Tax Liability.

Coal, like many other natural resources, receives preferential tax treatment both on the income and deduction side of the taxable income equation. On the income side, coal may be eligible for capital gains treatment upon sale; that is, number 2 on the list, income from the activity taxed at a lower rate.[145] On the deduction side, coal may be eligible for a percentage depletion deduction. Percentage depletion is a special form of depreciation that allows the total deduction to exceed the taxpayer's investment in the asset; that is, factor number 3 on the list, better deductions. However, if the taxpayer avails himself of the special capital gains treatment of coal, he cannot also take a depletion deduction.[146] Finally, the Energy Tax Incentives Act ("ETIA")[147] added several new credits that apply to the coal industry: number 4 on the list.

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140. I.R.C. § 167 (2007).

141. I.R.C. § 168 (2007). The Joint Committee considers accelerated depreciation a tax expenditure. Estimates of Federal Tax Expenditures, *supra* note 133, at 6.

142. For example, investors in state or municipal bonds may exclude the interest from gross income. 26 U.S.C. § 104 (2007).

143. For example, long-term capital gains are taxed at a lower rate than ordinary income. I.R.C. § 1(h) (2007).

144. See discussion *infra* at 130-36.

145. I.R.C. § 631(c) (2007).

146. Treas. Reg. 1.611-1(b)(2).

147. The Energy Policy Act of 2005, H.R. 6, 109th Cong., 1st Sess., Pub. L. No 109-58, 119 Stat. 986.

A. *Economic Interest*

Whether the taxpayer is eligible to receive the benefits of capital gain tax treatment or percentage depletion treatment turns on whether the taxpayer has an "economic interest in the property."[148] The economic interest concept also applies to other minerals; the case law that has developed frequently involves oil. An economic interest exists if the taxpayer "has acquired, by investment, any interest in the oil in place, and secures, by any form of legal relationship, income derived from the extraction of the oil, to which he must look for the return of his capital."[149] Thus, a taxpayer may have an economic interest through direct ownership, a lease, or other contractual relationship. The Supreme Court has considered the economic interest concept in the area of coal mining several times.[150] Investors and coal mining operators need to pay close attention to the parameters of the Supreme Court's decisions to ensure availability of capital gains treatment or percentage depletion. For our purposes, it is enough to note that many taxpayers succeed in obtaining preferential tax treatment. The federal government predicts that, over the next five years, coal investors will gain $320 million via the capital gains provision[151] and $500 million via percentage depletion.[152]

B. *Capital Gains*

To obtain capital gains treatment on the disposition of an interest in coal, the taxpayer must meet three requirements:

1. The coal must be held for more than one year before disposal;
2. The disposing taxpayer must be the "owner" of the coal; and
3. The taxpayer must retain an "economic interest" in the coal under the disposing contract.[153]

The capital gains treatment for dispositions of coal interests originated with a similar benefit for timber owners.[154] In the case of timber owners, the benefit was

148. *See* Richard A. Westin, *Mineral Properties Other Than Gas or Oil—Operation*, 603 T.M. A-3 (2002).

149. Palmer v. Bender, 287 U.S. 551, 557 (1933). *See also* Treas. Reg. 1.611-1(b).

150. Parsons v. Smith, 359 U.S. 215 (1959); Paragon Jewel Coal Co. v. Comm'r, 380 U.S. 624 (1965); U.S. v. Swank, 451 U.S. 571 (1981).

151. OMB, ANALYTICAL PERSPECTIVES 287 (2007), Table 19-1, *available at* http://www.whitehouse.gov/omb/budget/fy2007/; Estimates of Total Income Tax Expenditures (assuming coal constitutes the majority of "other fuels.")

152. Estimates of Federal Tax Expenditures, *supra* note 133, at 30.

153. I.R.C. § 631(c) (2007).

154. Richard A. Westin, *Mineral Properties—Exploration, Acquisition, Development and Disposition*, 601 2d T.M.P. A-57 (2002).

designed to encourage cutting of timber during World War II.[155] Before the enactment of the provision, a timber owner who cut timber for sale as logs had to pay tax on the profits at ordinary income rates, while a timber owner who sold timber outright on the stump recognized capital gains.[156] This disparity created an incentive to sell timber outright, rather than to manage timber for continuous supply. Accordingly, in 1944, Congress enacted a statute permitting timber owners to elect to receive capital gains tax treatment on a timber cutting.[157]

The coal provision, enacted in 1951, granted capital gains treatment for certain coal royalties.[158] In broad terms, the legislation created a benefit for coal owners not available to other types of business investment. Generally, to receive capital gains treatment, the owner must sell the asset.[159] If, on the other hand, the owner leases or rents the asset, the proceeds received are taxed as ordinary income.[160] Royalties are analogous to lease payments—the investor does not sell the property or mineral rights but rather allows the mining company to work the mine in exchange for a payment or series of payments.[161] Thus, taxing an owner who receives royalties at capital gains rates constitutes preferential tax treatment. Historically, the coal capital gains provision may have had a similar purpose to the timber capital gains provision: to encourage proper management of coal mines and coal resources. Today, when coal competes with renewable energy resources, is the additional incentive a sensible deal for the taxpaying (and air-breathing) public?

C. Percentage Depletion

Percentage depletion gives coal a special benefit on the deduction side of the taxing equation. Depreciation deductions, which apply to most business assets, cannot exceed the taxpayer's cost in the asset. Using one of several depreciation methods, depreciation deductions are determined by allocating the taxpayer's basis over the life of the asset.[162] Percentage depletion, which only applies to certain natural resource assets, is determined by multiplying gross income from the property by the

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155. U.S. v. Brown Wood Preserving Co., 275 F. 2d 525, 527 (6th Cir. 1960).

156. *See generally*, F. Geral Burnett, *Timber Transactions*, 610 T.M. Portfolio A-2 (1994).

157. Revenue Act of 1943, Ch. 63., § 127, 58 Stat. 21 (1944), currently codified at I.R.C. § 631(a) (2007).

158. Revenue Act of 1951, Pub. L. No. 183, § 324(b), 65 Stat. 452 (1951), currently codified at I.R.C. § 631(c) (2007). Unlike the timber provision, the coal provision is not elective. If the statutory requirements are met, the coal is treated as a "§ 1231 asset" and generally if gain is recognized, it will be treated as capital gain. For an in-depth analysis of the workings of I.R.C. § 1231, see Boris I. Bittker and Martin J. McMahon, *Federal Income Taxation of Individuals* ¶33

159. I.R.C. § 1222 requires a "sale or exchange."

160. *See* Boris I. Bittker and Martin J. McMahon, Federal Income Taxation of Individuals ¶ 32.1[5].

161. Burnet v. Harmel, 287 U.S. 103, 108 (1932) ("[P]ayments by lessees to lessors under mining leases were not a conversion of capital, as upon a sale of capital assets, but were income to the lessor, like payments of rent.")

162. I.R.C. §§ 167, 168 (2007).

appropriate depletion rate.[163] Unlike depreciation, percentage depletion continues even after the full cost of the property has been recovered. It continues until the property ceases to produce income. The total benefit from percentage depletion will always exceed normal depreciation if the operation is profitable.[164] One scholar from the Appalachian region, a region with a long history in the coal industry, has argued that eliminating the percentage depletion deduction would ensure certainty and equal treatment under the tax laws; encourage the development of renewable energy sources, thereby abating further environmental harm caused by mining and extraction of fossil fuels; and, create increased tax revenue to fund reparations for damages caused by coal mining and oil extraction.[165]

There is a clear alternative for coal producers and extractors: they can use cost depletion (calculated by multiplying the adjusted basis of the property by the units sold and dividing the result by the units remaining at the end of the year plus the units sold).[166] Under current law, either a cost depletion or a percentage depletion deduction may be taken, depending on whichever results in a greater deduction.[167] Cost depletion, unlike percentage depletion, will never exceed the investment in the property, and coal investors will not receive an added tax break at the expense of other taxpayers.

D. Tax Credits for Coal

There are three categories of coal tax credits: the renewable energy production tax credit,[168] the synthetic fuel credit,[169] and clean-coal tax credits.[170] Surprisingly, for those who may have thought coal was a fossil fuel, the renewable electricity production credit contains two coal tax benefits: the refined coal production credit[171] and the Indian coal credit.[172] The synthetic fuel credit (synfuel credit), added by the Crude Oil Windfall Profits Act of 1980,[173] is calculated based on a barrel-of-oil Btu equivalent, and is phased out if the market price of oil increases above a certain reference level.[174]

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163. I.R.C. § 613(c) (2007).

164. Richard A. Westin, *Mineral Properties Other Than Oil and Gas—Operation*, 603 T.M.P. A-28 (2002).

165. Wendy B. Davis, *Elimination of the Depletion Deduction for Fossil Fuels*, 26 SEATTLE UNIV. L. R. 197, 201 (2002). While I do not agree with some of her reasoning, (for example, I do not agree that coal in a coal mine should be analogized to flour in a bakery – it is uncertain how much coal there is, and how much it will cost to extract it, while the baker can simply scoop it out of the bin), I support her conclusion.

166. Treas. Reg. § 1.611-2(a).

167. *Id.*

168. I.R.C. § 45 (2007).

169. I.R.C. § 45K (2007).

170. I.R.C. §§ 48A, 48B (2007).

171. I.R.C. § 45(c)(7) (2007).

172. I.R.C. § 45(c)(9) (2007).

173. Pub. L. No. 96-223.

174. I.R.C. § 45K (2007).

The clean-coal tax credits are:

1. A 20% investment tax credit for integrated gasification combined-cycle projects, up to a total of $800 million for all such projects;
2. A 15% credit for other advanced coal-based projects, to include only investments in property associated with the gasification of coal, up to a total of $500 million for all such projects;
3. A 20% investment credit for certified gasification projects, up to a total of $350 million for all such projects.

The renewable energy production credits for coal represent not only a shocking misuse of language but also unsound energy policy. While the capital gains treatment for coal royalties and the coal percentage depletion allowance have a historical justification, there is no excuse for including coal under the title of "renewable energy" in the 2005 Energy Tax Incentives Act.

That being said, refined coal is carefully defined in the statute with the evident purpose of reducing pollution from electricity generation. Refined coal is defined as a qualifying liquid, gaseous, or solid synthetic fuel produced from coal.[175] To qualify, the fuel must emit 20% less nitrogen oxides and either sulfur dioxide or mercury than the burning of comparable non-refined coal.[176] The refined fuel must also sell at prices at least 50% greater than comparable non-refined coal. The credit for production of refined coal, originally added to the renewable energy production credits by the American Jobs Creation Act of 2004,[177] provides a credit per ton of refined coal used, phased out as the market price of the "feedstock" coal exceeds certain levels.[178] Feedstock coal refers to the coal used to produce the refined coal. The credit applies to refined coal produced by facilities placed in service after Oct. 22, 2004, and before Jan. 1, 2009.[179] The refined coal must sold by the taxpayer "with the reasonable expectation that it will be used for purposes of producing steam."[180] Burning coal to make steam is a usual step in electricity production. While reducing pollution from burning coal is a step in the right direction, is a credit for producing modified coal the answer? As discussed below, this has been attempted before, with some unfortunate results.

The refined coal provision seems to be similar to the synfuel provision. A qualified fuel under the synfuel credit includes "liquid, gaseous, or solid

175. Jt. Comm. Tax'n, Description and Technical Explanation of the Conference Agreement of H.R. 6, Title XIII, the "Energy Tax Incentives Act of 2005," at 19, JCX-60-05 (July 28, 2005).

176. *Id.*

177. Sec. 710(g)(5), Pub. L. No. 108-357.

178. I.R.C. § 45(e)(8) (2007).

179. *Id.*

180. I.R.C. § 45(c)(7) (2007).

synthetic fuels produced from coal."[181] Originally conceived in 1980 as a way to reduce dependence on foreign oil, the synfuel credit has been called a scam, a scheme, and a boondoggle.[182] The Internal Revenue Service ("IRS") requires that coal be chemically altered to qualify for the synfuel credit.[183] Alterations that passed muster included spraying coal with diesel fuel, pine-tar resin, limestone, acid, or other substances—a method known as "spray and pray".[184] Many companies lost money on synfuel production, only to make immense profits from the tax credits.[185] Representative Lloyd Doggett introduced a bill to repeal the credit in 2004 and 2005, but the reported $5 million spent by the synfuel lobby achieved its desired effect.[186] The synfuel credit will expire at the end of 2007, but the Energy Tax Incentives Act of 2005 (ETIA) gave new life to the credit in two ways. First, it made the credit a part of the general business credit, which permitted unused credits to be carried forward 20 years. This seemingly innocuous change will cost the taxpayers $88 million over the next ten years.[187] In fact, some synfuel producers look forward to enjoying even more benefits after their plants close. A spokesman for Progress Energy, which has $920 million of carryover credits, said that "the real cash benefit will come in after we shut down the plants and utilize the tax benefit without the operating costs."[188] Future legislation could provide even more benefits for coal-based liquid fuels. The New York Times recently reported that alternative fuel subsidies for coal could dwarf those for ethanol.[189] Second, ETIA added a production credit for coke or coke gas (a coal derivative), which will be available until the end of 2009, at a cost to taxpayers of $101 million.[190] Finally, the modifications fail to reduce our dependence on foreign oil, or to reduce emissions from the modified coal.[191]

The credit for Indian coal contains no environmental benefits.[192] Indeed, this provision is an example of tying an environmentally degrading industry to an

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181. I.R.C. § 45K(c) (2007).

182. *See* Donald L. Bartlett and James B. Steele, *A Magic Way to Make Billions*, TIME MAGAZINE (Feb. 26, 2006). The synfuel tax credit was called "particularly prone to fraud and abuse" *2004 Green Scissors Report available at* http://www.greenscissors.org/publications/gs2004.pdf.

183. Rev. Rul. 86-100, 1986-2 C.B. 3.

184. Bartlett & Steele, *supra* note 182.

185. *Id.*

186. Press Release, Lloyd Doggett, Rep. Lloyd Doggett Targets Synfuel Credit (Feb. 16, 2005), available at http://www.house.gov/; Bartlett & Steele, *supra* note 182.

187. JCT, Estimated Budget Effects of the Conference Agreement for Title XIII of H.R.6, the Energy Tax Incentives Act of 2005, JCX-59-05 (July 27, 2005).

188. Steven D. Jones, *Synthetic Fuels Will Power Profits Long After Plants Have Closed*, WALL ST. J. at C3 (June 2, 2006).

189. Edmund L. Andrews, *Lawmakers Push for Big Subsidies for Coal Process*, www.nytimes.com (May 29, 2007).

190. JCX-60-0, *supra* note 175, at 7 – 8; JCX-59-05, *supra* note 187.

191. 2004 Green Scissors Report *supra* note 182, at 11.

192. I.R.C. § 45(c)(9) (2007).

economically disadvantaged community.[193] Community resistance to the environmental hazard may be reduced by the expected benefit, and outside opposition to the project can be deflected by expressing concern about the community's economic health. Indian coal is defined as coal that is produced from coal reserves owned by Indian tribes or held in trust by the United States for the benefit of an Indian tribe or its members.

In contrast to the other coal tax benefits, the clean-coal tax credits have the potential to encourage environmentally friendly technology. However, it may be hard to decide whether promoting clean-coal technology is good news or old news. IGCC technology currently exists that can eliminate most toxic emissions from coal-powered electricity generating plants.[194] IGCC plants also use significantly less water and produce less solid waste than conventional pulverized coal-fired ("PC") plants.[195] Over twenty years ago, a government program called the Clean Coal Technology ("CCT") Demonstration Project offered $2.75 billion to companies to develop and build clean-coal plants.[196] Today, only two CCT projects' IGCC plants are up and operating in the United States.[197] Although early IGCC plants experienced reliability problems that have now largely been resolved, current operating costs of IGCC plants are similar to those of conventional PC plants.[198] However, the cost of building an IGCC plant is significantly higher than building a PC plant. [199]

Clean-coal technology seems to be an ideal candidate for a tax credit. A 2001 study by the American Council for an Energy-Efficient Economy ("ACEEE") outlined principles for energy efficient tax incentives, which included:

- Stimulating commercialization of advanced technologies;
- Establishing performance criteria and pay for results;
- Paying substantial incentives;
- Choosing technologies where first cost is a major barrier;

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193. From 1908 until 2000, a percentage of the proceeds from timber sales in National forests was allocated to rural counties for schools and roads. 16 U.S.C. 500 (2007). Some argued that logging companies and politicians used the link between timber sales and rural schools "to promote reckless logging and the destruction of our children's natural heritage, clean air and clean water." Oregon Natural Resources Council (ONRC) website, http://www.onrc.org/alerts/241.county.html, last visited Sept. 2, 2006. In 2000, Congress, recognizing the decline in timber sales due to factors including environmental restrictions, made permanent a 1993 provision that allowed payments to be made to counties with National Forests out of general Treasury funds. Secure Rural Schools and Community Self-Determination Act of 2000, Pub. L. 106-393 (2000). The Bush Administration proposes to re-establish the link between logging and rural schools.

194. Environmental Footprints, *supra* note 61.

195. *Id.*

196. GAO, Clean Coal Technology Status, GAO/RCED-00-86R (2000).

197. Environmental Footprints, *supra* note 61, at 2-6. The two plants are the Polk County IGCC Project, which began operating in 1996 in Florida; and the Wabash River IGCC Project, which began operating in 1995 in Indiana.

198. *Id.* at ES-5.

199. *Id.*

- Complementing other policy initiatives; and
- Allowing adequate time before phasing out the incentives.[200]

Clean coal incentives can be considered energy efficient tax incentives, if only in comparison to conventional coal technologies. IGCC and other advanced clean-coal technologies have resisted commercialization for at least twenty years.[201] The Senate provision allocated the credit based on megawatts of power generation; the EITA allocates the credit based on dollars of investment.[202] One could argue that allocating the credits based on power generated would be more like paying for results than allocating the credits based on cost of the project. Cost is no guarantee of effectiveness, as shown by the synfuel credit abuses.[203] However, the credits can only be allocated to projects certified by the Secretary of the Treasury in consultation with the Secretary of Energy, to ensure that the projects could be reviewed for potential effectiveness. In addition, the IRS requires a Department of Energy ("DOE") certification of feasibility and consistency with energy policy goals before it will consider a project eligible for the credit.[204]

The statute requires the Secretary to give high priority in awarding credits to IGCC projects that include:

- greenhouse gas capture capability;
- increased by-product utilization, and
- other benefits.[205]

The incentives available seem substantial—each IGCC project could receive up to $133.5 million in credits.[206] However, if each IGCC project received the maximum credit, this provision could assist in six projects.[207] According to an EPA report, the capital cost of a 500-megawatt IGCC plant ranges from $680 million to $775 million.[208] A $667.5 million plant could fully utilize the $133.5

200. *Patrick Quinlan et al., Tax Incentives for Innovative Energy-Efficient Technologies* 2 (ACEEE Rep. No. E013) (2001).

201. At least, IGCC technology has not become widespread in the United States. A scientist testifying before the Senate Energy and Natural Resources Committee noted "gasification is commercial and needs no subsidy, but [CO2] capture and storage is the primary policy objective." Martin A. Sullivan, *Tax Credits Ease Economy's Shift to Coal*, 112 TAX NOTES 901 (2006) (quoting Antonia Hertzog with the Natural Resources Defense Council).

202. JCX-60-05, *supra* note 175, at 36 – 37.

203. *See* discussion *supra* at note 182..

204. Notice 2006-24.

205. I.R.C. § 48A(e)(3)(B) (2007). *See also* Notice 2006-24.

206. Notice 2006-24.

207. Calculated by dividing the total amount available to IGCC projects ($800 million) by $133.5 million.

208. Environmental Footprints, *supra* note 61, at A-3.

million of credits. Six 500-megawatt projects could generate 3,000 megawatts per hour, or 26.28 million megawatts per year. For comparison, in 2004, the United States used 1.957 billion megawatts of coal-fired capacity.[209] The EIA predicts that 84,700 MW of new IGCC capacity will be built by 2030.[210] Clearly, the tax credits will only play a small part in that expansion, if it occurs.

The clean-coal credits do target a technology that has a significant first-cost barrier. While the capital cost to build a conventional coal plant ranges from $1,347 to $1,511 per kW, the capital cost to build an IGCC plant ranges from $1,670 to $2,350 per kW.[211] Significant interest has been expressed in the clean-coal tax credits: as of August 14, 2006, the Department of Energy had received 18 applications for IGCC plants and 4 applications for other clean coal projects.[212] The credits requested by the applications totaled $2.3 billion, with a total available credit of $1.3 billion, so the I.R.S. will make their final selection by November 30, 2006.[213]

The clean-coal tax credits may complement other policy initiatives, if the policy initiatives are cleaner air and water. However, it is more difficult to determine whether the clean-coal tax credits can be reconciled with the renewable energy tax credit for refined coal and Indian coal, as well as the historic tax benefits for coal. The clean-coal tax credits are undoubtedly a step in the right direction, although critics have commented on their design flaws.[214] Clean-coal technology reduces toxic emissions and water use. Although the clean-coal tax credits do not address GHG emissions directly, IGCC technology permits more cost-effective CO_2 abatement and the I.R.S. must give priority to those projects that have the potential for carbon capture.[215] The MIT Study concluded that there is no justification for government support of coal projects that do not include CCS.[216] For the most part, tax policy on coal continues to look backward, encouraging coal use without requiring the industry to pay the price of pollution. The clean-coal tax credits may result in only a few more IGCC plants being built. If society is willing to bear the cost of additional pollution, the electricity generation industry may have little incentive to spend more to build

209. EIA Annual Coal Report 2005, http://www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.html

210. EIA, Annual Energy Outlook 2006, *supra* note 26, at 101.

211. Environmental Footprints, *supra* note 61, at A-3.

212. U.S. Dept. of Energy, *Tax Credit Programs Promote Coal-Based Power Generation Technologies: Energy Department Assists Internal Revenue Service in Project Selection, Fossil Energy Techline* (Aug. 14, 2006), *available at* http://fossil.energy.gov/news/techlines/2006/06048-Coal_Tax_Credit_Program.html.

213. *Id.*

214. Martin A. Sullivan of Tax Notes comments: "[With respect to] the development of the clean coal credits, Congress seems to have been more concerned with political balance than policy coherence. Why, for example, did Congress allocate $267 million to IGCC systems using bituminous coal, $267 million to IGCC systems using subbituminous coal, $267 million to IGCC systems using lignite . . . The best policy would have been technology neutrality. That is, the projects that hold the most promise for reducing carbon emissions should take priority regardless of the technology." Sullivan, *supra* note 201, at .

215. *See* Notice 2006-24.

216. *See MIT Study*, *supra* note 64, at 99.

cleaner plants. If, on the other hand, coal-powered plants were required to pay the full cost of the environmental damage they cause, building cleaner plants would be the right economic decision.

D. Black Lung Excise Tax

The coal industry pays for part of its external costs through the black lung excise tax.[217] This provision, added in 1977, imposes on the mine operator an excise tax on coal.[218] The tax is $1.10 per ton of coal from underground mines, and 55 cents per ton from surface mines.[219] The tax applies to raw tonnage of coal, which includes any waste and dirt.[220] The mine operator may wash the coal before sale, thus reducing the amount of tonnage and consequently reducing the tax.[221] The tax does not apply to lignite producers.[222] A 1974 study estimated that one in ten miners would die from black lung disease.[223] A 1990 study determined that for every three years of exposure to the federally mandated coal mine dust level, the average miner will experience a loss in lung function equal to the average yearly normal loss in lung function due to aging.[224] The incidence of black lung disease in coal miners should continue to decrease, as the demand shifts to low sulfur Western coals. Most Western mines use surface extraction methods, which expose workers to far lower dust concentrations.[225] The existence of the black lung excise tax indicates that at one time Congress was willing to place responsibility for one of external cost of coal mining directly on the coal producer. Perhaps soon, Congress might be willing to place responsibility for the GHG emissions caused by coal-fired power plants on those who profit from coal use.

V. MAKING COAL PAY: THE CASE FOR A CARBON TAX

Coal has the highest carbon intensity of all fossil fuels. The U.S. federal income tax system encourages the use of coal by preferential tax treatment. Using coal to generate electricity results in GHG emissions; regardless of the technology used to generate the power. Using advanced coal technologies such as IGCC reduces the cost of GHG mitigation, but does not eliminate the need for such mitigation. While the tax system encourages the use of advanced coal technologies,

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217. I.R.C. § 4121 (2007).

218. *See* Richard A. Westin, *Mineral Properties Other Than Gas and Oil—Operation*, 603 T.M.P. A-34 (2002).

219. I.R.C. § 4121(b)(1)-(3) (2007).

220. Rev. Rul. 79-119, 1979-1 C.B. 350.

221. *See* Moose Coal Co. v. U.S., 92-1 USTC ¶70,014 (W.D. Va. 1991).

222. I.R.C. § 4121(c) (2007).

223. Oak Ridge Nat'l Lab, *supra* note 32, at 8-17.

224. *Id.*

225. *Id.*

it also encourages conventional coal technologies, because many of the tax benefits that accrue to coal are not dependent on the technology used to extract its energy. The tax preferences that encourage coal use have the effect of reducing its cost. However, even without tax preferences, the cost of coal does not include many of the environmental impacts of extracting and burning coal. Assuming that society wants to avoid the environmental costs of coal, there are several ways of requiring coal producers and users to pay for those costs. Broadly speaking, these methods fall into two categories: command-and-control regulations and market-based instruments. Command-and-control rules, common in the early days of environmental regulation, are now less popular than market-based instruments.[226] Market-based instruments may work to limit the quantity of pollution by putting a cap on the total quantity of pollution permitted; issuing permits to pollute up to the amount of that cap; and allowing trading of the permits. The Acid Rain Program SO_2 Allowance Trading program is an example of this type of market-based instrument.[227]

Pollution taxes are another type of market-based instrument. Pollution taxes work to cap the cost of abating the environmental hazard. One commentator called pollution taxes "the presumptive first choice for optimal environmental regulation."[228] Restricting GHG emissions in a cost-effective way calls for a carbon tax. A carbon tax would be simpler, more flexible, and more effective than a tradable allowance program. One commentator noted that cost restrictions, such as a carbon tax, work better than quantity restrictions when "health or environmental damages are not very sensitive to short-term emissions levels or when concerns exist about potentially high costs."[229] Short-term increases in GHG emissions do not cause environmental damage—rather, cumulative exposures eventually result in climate change.[230] Concerns about high costs have been a recurring justification of the Bush Administration's past refusal to deal with increasing GHG emissions.[231]

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226. *See* Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Justice*, 56 WASH. & LEE L. REV. 111, 112 (1999) (noting that critics of command-and-control regulation "argue that [it] (i) imposes unreasonable information-gathering and exorbitant costs on government; (ii) often imposes disproportionate burdens on new pollution sources; and (iii) provides no incentives to polluters to develop new strategies to reduce their pollution beyond the levels required by law." [footnotes omitted])

227. E.P.A., *Clean Air Markets – Programs and Regulations*, available at www.epa.gov/airmarkets.

228. Jonathan Baert Wiener, *Global Environmental Regulations*, 108 YALE L. J. 677, 682 (1999).

229. Richard D. Morganstern, *Reducing Carbon Emissions and Limiting Costs*, 3-4 (Feb. 2002), *available at* www.rff.org/climatechangemorganstern.pdf.

230. *Id.*

231. *See, e.g.*, Larry Parker, *Global Climate Change: Controlling CO2 Emissions – Cost Limiting Safety Valves*, Cong. Res. Serv. Rep. No. RS21067 at 1, 3 (Dec. 2004); Eric Pianin & William Drozdiak, *Bush's Reversal Could Affect Global Warming Agreement*, WASH POST. (Mar. 16, 2001) (stating that Bush refused to support the Kyoto Protocol because it would be burdensome for the U.S. economy); James M. Lindsay, *Global Warming Heats Up: Uncertainties, Both Scientific and Political Lie Ahead*, 19 BROOKINGS REV. 26, 28 (2001) (Bush's change in position due to downturn in U.S. economy). President Bush recently called for a summit to set a long-term global strategy for reducing carbon emissions. *See* Deb Riechmann, *Bush Calls for Global Emissions Goals*, www.washingtonpost.com (May 31, 2007). *See also*, Mark Lanlder and Judy Dempsey,

Accordingly, carbon taxes appear to be the best choice of instrument for GHG cotrol.

Carbon taxes are simpler than tradable permit systems. In a permit or allowance system, the administrator must determine the target emission reduction, the number of permits, to whom the permits will be issued, and the initial cost (if any) of the permits.[232] Unless unlimited costs are acceptable, a cost cap, and its method of implementation, must be determined. For a carbon tax, the administrator need only set the amount of the tax on the carbon emitted. If the emissions fail to decline rapidly enough, the administrator raises the tax rate. On the other hand, if the cost of the tax is deemed to be too great on the economy, the administrator lowers the tax rate. A carbon tax would also be more effective in spurring technological change. In the case of the coal industry, the cost of CO_2 controls on conventional plants greatly exceeds the cost of CO_2 controls on IGCC plants. A tradable permit scheme for GHG emissions would reduce the pressure on power companies to make the switch to IGCC, thus ultimately endangering GHG limits.[233]

Businesses are in favor of the carbon tax idea as well. Duke Energy has been the most vocal business advocate for a carbon tax.[234] Richard Osborne, group vice president for public and regulatory policy, wrote:

> [w]e don't need complex, prescriptive regulation, but rather an economy-wide solution that provides price signals for companies and individual consumers alike to reduce the carbon they emit from all sources."[235] He notes that "by setting a carbon 'price,' a carbon tax would encourage firms and households to take least-cost steps to shift or reduce consumption and thereby reduce emissions.[236]

The Congressional Budget Office ("CBO") agrees that a carbon tax would be relatively simple to administer.[237] The CBO examined the effect of an "upstream" tax on carbon emissions.[238] An upstream tax would be imposed on producers and

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Europe and U.S. Move Toward Climate Deal, www.nytimes.com (June 7, 2007) (U.S. agreed to "seriously consider" a European proposal to halve GHG emissions by 2050).

232. *See* Nat'l Comm'n on Energy Policy, *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges,* 21–29 (Dec. 2004) (describing the National Commission on Energy Policy's recommended tradable permit system for GHG emissions).

233. One recent legislative proposal would establish a market for tradable GHG allowances. See the Climate Stewardship Act of 2005, S. 342, 109th Cong., 2d Sess. (2005).

234. Richard Osborne, Submission of Duke Energy Corporation to the Federal Tax Reform Advisory Panel (April 29, 2005). Although Mr. Osborne advocated a carbon tax to the President's Tax Reform Panel, the suggestion was not included in the final report.

235. Richard Osborne, *The Case for a Carbon Tax*, Executive Council, 54 (Sept./Oct. 2005).

236. *Id.* at 55.

237. CBO 2005 Budget Options, Revenue Option 53 Impose an "Upstream" Tax on Carbon Emissions, *available at* http://www.cbo.gov.

238. *Id.*

importers of fossil fuels on the basis of the carbon emissions that would be released when their fuel was burned. Accordingly, goods and services produced by carbon-intensive processes would be more expensive, thus creating an incentive to conserve or develop alternative technologies. In addition, a carbon tax could raise revenue that could be used to pay for credits for renewable energy, advanced energy technologies, or carbon sequestration.[239] The rate of tax in dollars per ton should reflect the damages caused by emitting a ton of carbon.[240] The CBO, using figures developed by Yale researchers William Nordhaus and Joseph Boyer, used a $12 per ton (of carbon) tax, and estimated that the tax could raise $208 billion from 2006 through 2015.[241]

Recent experience and new studies have raised more issues with carbon cap and trade programs. In implementing the limited carbon trading scheme under the Kyoto Protocol, Europe has already faced extreme volatility in carbon allowance prices.[242] The complexity of a carbon trading program makes it vulnerable to manipulation by special interests and cheating. The voluntary carbon cap-and-trade program currently has already generated large profits for certain companies, while producing little environmental benefit.[243] Aside from outright corruption, the development of a carbon trading program, with its many complex parts, will take a long time. In fact, one might suspect that the political popularity of a cap-and-trade system may be due to the ease of postponing action.[244] Carbon taxes could be quickly implemented and easily adapted if problems arise.

A carbon tax is essentially a consumption tax, and like any other consumption tax raises issues of distributional justice.[245] A carbon tax would adversely impact certain energy industry workers—such as coal miners. A carbon tax would potentially have a greater impact on lower-income households because they spend

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239. One study suggests that carbon sequestration from coal combustion is essential to mitigate global warming, and presents some encouraging news of technologies, including injecting carbon dioxide below the ocean floor. Daniel P. Schrag, *Preparing to Capture Carbon*, 315 SCIENCE 812 (2007). He notes that "compared with the cost of most renewables, increasing the cost of electricity from coal by 50 percent [for carbon sequestration] seems like a bargain." *Id.* at 813.

240. *See* Ajay K. Sanghi, *Role of Control Costs in Developing Climate Change Policy* 264, 266, in O. HOHMEYER & R.L. OTTINGER (EDS.), EXTERNAL ENVIRONMENTAL COSTS OF ELECTRIC POWER (1991).

241. *Id.*

242. William D. Nordhaus, *Life After Kyoto: Alternative Approaches to Global Warming Policies*, YALE UNIVERSITY (Dec. 9, 2005) at 15. *See also*, Kenneth P. Green, Steven F. Hayward, and Kevin A. Hassett, *Climate Change: Caps vs. Taxes, AEI Environmental Policy Outlook No. 2* (June 2007).

243. *See* Keith Brasher, *Outsize Profits, and Questions, In Effort to Cut Warming Gases*, N.Y. TIMES at A1 (Dec. 21, 2007).

244. There are five cap-and-trade bills before Congress, and only one carbon tax bill. Cap-and-trade bills include: S.1201, Clean Power Act of 2007; S. 1177, Clean Air Planning Act; S. 1168, Clean Air/Climate Change Act of 2007; S. 309, Clobal Wamring Pollution Reduction Act; and H.R. 620, Climate Stewardship Act. (all 110th Cong., 2d Sess. 2007). The lone carbon tax bill is H.R. 2069, Save Our Climate Act of 2007. It is by far the shortest and simplest bill of the lot.

245. *See, e.g.*, John S. Nolan, *The Merit of an Income Tax Versus a Consumption Tax*, 12 AM. J. TAX POL'Y 207, 215 (1995) (noting that "Consumption taxes tend to be regressive, as compared to income taxes. Higher income individuals spend a smaller percentage of their income on consumption. Higher income individuals have a higher percentage of their income from savings.")

a greater portion of their income on energy and energy-intensive goods. However, the revenue raised by a carbon tax could be directed to mitigate such disproportionate impacts.[246]

Why aren't more policy-makers looking at the carbon tax alternative?[247] The answer may be found in the visceral reaction to the word "tax." Charles Adams noted "Throughout the first half of our history, Americans hated tax with a passion, something they inherited from the founding fathers."[248] Professor Joshua Rosenberg notes that "for most Americans, any tax is a bad tax."[249] Rosenberg opines that our hatred of tax is a Pavlovian response to adverse conditioning: "people who feel frustration and loss whenever their attention is focused on taxes will begin to feel frustration and loss at the idea of taxes."[250] Economists Edward McCaffery and Jonathan Baron conducted a number of experiments on taxpayers to determine whether the label or structure of a tax affected their perception of the tax.[251] They found that subjects reacted differently to levies called a tax than to those called payments, even where the levy placed an identical economic burden.[252] Tradable permits and taxes are both economic instruments, and can be structured to have the same economic effect.[253] Interestingly, the public may be more favorably disposed towards a carbon tax than towards taxes generally. The MIT study noted that over the past three years, Americans' willingness to pay to solve global warming has grown 50 percent.[254] Half of those surveyed considered global warming a top environmental concern, and those participants were willing to pay $27 per month more for their power usage.[255] The other half were willing to pay $16 per month more.[256] It would be a pity to limit the choice to tradable permits when carbon taxes are simpler and more flexible, simply because the word "tax" displeases.

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246. *See* Robert B. McKinstry, Adam Rose, & Coreen Ripp, *Incentive-Based Approaches to Greenhouse Gas Mitigation in Pennsylvania: Protecting the Environment and Promoting Fiscal Reform*, 14 WIDENER L. J. 205, 219 (2004).

247. *See* Roberta F. Mann, *Waiting to Exhale: Global Warming and Tax Policy*, 51 AM. U. L. REV. 1135, 1212 (2002) (discussing previous failed legislative efforts to enact a carbon tax).

248. CHARLES ADAMS, THOSE DIRTY ROTTEN TAXES: THE TAX REVOLTS THAT BUILT AMERICA at xi (1998).

249. *See* Joshua D. Rosenberg, *The Psychology of Taxes: Why They Drive Us Crazy, and How We Can Make Them Sane*, 16 VA. TAX REV. 155, 158 (1996).

250. *Id.* at 178.

251. Edward J. McCaffery and Jonathan Baron, The Political Psychology of Redistribution, CLEO Research Paper Series, Research Paper No. C05-4 (2005), *available at* http://ssrn.com.abstract=695305.

252. *Id.* at 19.

253. *See* Henry D. Jacoby & A. Denny Ellerman, *The "Safety Value" and Climate Policy, MIT Joint Program on the Science and Policy of Global Change*, Rep. No. 83 at 2 (Feb. 2002), *available at* http://web.mit.edu/globalchange/www/reports.html#pubs (suggesting that a cap-and-trade program with a "safety value" price cap can have the economic effect of an emissions tax, if the target price is set low enough that the emissions usually exceed the quantity limit).

254. *MIT Study*, *supra* note 64, at 90.

255. *Id.* at 90 – 91.

256. *Id.*

VI. CONCLUSION

America is hooked on energy, and it is likely that coal will continue to play an important role in America's future energy policy. The United States has the world's largest coal reserves and coal companies wield considerable political clout. But the United States is not exempt from the dangers of climate change, and a growing number of businesses believe action is necessary to mitigate GHG emissions. Tax policy should play a role in helping the United States reduce GHG emissions from coal, as well as other sources. The tax system should stop encouraging the use of coal in conventional power plants. The preferential tax treatment of coal must end, unless the tax preference provides an incentive to use coal more cleanly and responsibly. By promoting the use of coal without mandatory carbon sequestration, even the clean-coal credits promote global warming. The federal tax system should provide economic incentives to reduce coal use by means of a carbon tax. These steps will provide certainty for business, which can then begin to plan with confidence for a reduced carbon future.

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