Exhibit 13

DECLARATION

1. I am Dr. Roger H. Bezdek, president of Management Information Services, Inc., (MISI), an economic research firm specializing in energy and environmental issues.

2. I have 40 years experience in consulting and management in the energy, utility, environmental, and regulatory areas, and have served in private industry, academia, and the U.S. Federal government. My experience includes Corporate Director, Corporate President and CEO, University Professor, Research Director in the Bureau of Economic Analysis of the U.S. Department of Commerce, Research and Program Director at the Energy Research and Development Administration and the U.S. Department of Energy, Special Advisor on Energy in the Office of the Secretary of the Treasury, and U.S. energy delegate to the European Community and to the North Atlantic Treaty Organization. I have served as a consultant to the White House, the Office of Vice President Al Gore, Federal and state government agencies, and various corporations and research organizations, including the National Science Foundation, NASA, DOE, DOD, EPA, IBM, Goldman Sachs, Raytheon, Lockheed Martin, J. P. Morgan Chase, BAE Systems, Ontario Power Generation, Eastman Kodak, American Solar Energy Society, Greenpeace, the Rockefeller Foundations, UN Environmental Program, Pew Charitable Trusts, the Blue Green Coalition, Japan Atomic Energy Research Institute, National Energy Technology Laboratory, Electric Power Research Institute, Edison Electric Institute, National Coal Council, and Nuclear Energy Institute. During 2003/04, I served on the Federal Task Force charged with rebuilding the economy of Iraq and in 2008 I presented energy briefings to the staffs of Senators Barack Obama, John McCain, and Hillary Clinton. I am active with the National Research Council of the U.S. National Academies of Science (NAS), and have served on various NAS committees, including, most recently, the joint NAS/Chinese Academy of Sciences Committee on U.S.-Chinese Energy Cooperation and on the NAS Committee on Fuel Economy of Medium and Heavy Duty Vehicles. I have testified before the Federal, state, and city governments. I am the author of six books (including a book on energy policy published in September 2010) and over 300 articles in scientific and technical journals, I serve as an editorial board member and peer-reviewer for various professional publications, and am the Washington editor of *World Oil* magazine. I received a Ph.D. in Economics from the University of Illinois (Urbana)

3. I prepared this Declaration and the attached study.

4. As demonstrated in the attached study, in recent months, EPA has taken four related actions that, taken together, trigger PSD applicability for GHG sources on and after January 2, 2011. These actions, the Endangerment Finding, the Johnson Memo Reconsideration, the Tailpipe Rule, and the Tailoring Rule, will affect numerous entities and lead to the most comprehensive, restrictive, and intrusive environmental regulations in U.S. history. A major impact of such regulations would be restrictions on the availability and increases in the prices of fossil fuels. The economic impacts would be serious, and this report analyzes the likely economic, employment, and energy market

impacts of EPA GHG control regulations on low-income groups, the elderly, and minorities.

5. The study's major finding is that the CO_2 restrictions implied in the EPA regulations would have serious economic, employment, and energy market impacts at the national level and that the impacts on low-income groups, the elderly, Blacks, and Hispanics would be especially severe. The EPA regulations will impact low income groups, the elderly, and minorities disproportionately, both because they have lower incomes to begin with, but also because they have to spend proportionately more of their incomes on energy, and rising energy costs inflict great harm on these groups.

6. Senior citizens are particularly vulnerable to energy price increases due to their relatively low incomes, and older consumers with the lowest incomes will experience the greatest cost burdens from the EPA regulations. Large percentages of the elderly have high energy burdens, and low income senior citizens dependent primarily on retirement income have especially high energy burdens. Thus, the greatest burdens of the increased energy costs resulting from EPA GHG regulations will fall on households of elderly Social Security recipients – more than 20 percent of all households -- who depend mainly on fixed incomes, with limited opportunity to increase earnings from employment.

7. The low-income elderly are particularly susceptible to weather-related illness such as potentially-fatal hypothermia, and a high energy burden can represent a life-threatening challenge. Given their susceptibility to temperature-related illnesses, elderly households require more energy to keep their homes at a reasonable comfort level. Implementation of the EPA GHG regulations would place many elderly households at serious risk by forcing them to heat and cool their homes at levels that are inadequate for maintenance of health.

8. Over the past decade, home heating costs have been increasing as a result of an overall rise in energy costs, and energy costs have increased more rapidly than the purchasing power of low-income consumers. As a result, winter heating costs present a special burden for seniors – especially low income seniors, and this burden will be exacerbated by the impending EPA GHG regulations.

9. Black and Hispanics will be adversely affected threefold by the EPA GHG regulations: Their incomes will be less than they would without the regulation, their rates of unemployment will increase substantially, and it will take those who are out of work longer to find another job. These impacts on earnings and employment will increase the rates of poverty among Blacks and Hispanics, and one of the impacts of implementing the EPA regulations will be to, by 2025:

- Increase the poverty rate for Hispanics from 23 percent to about 28 percent. This represents an increase in Hispanic poverty of nearly 22 percent.

- Increase the poverty rate for Blacks from 24 percent to about 30 percent. This represents an increase in Black poverty of 20 percent.

10. The added costs that will result from the EPA regulations will reduce Black and Hispanic household incomes by increasing amounts each year:

- In 2015, Black median household income will decrease about $550 compared to the reference case (which assumes that the EPA regulations are not implemented), and Hispanic median household income will decrease $630 compared to the reference case.
- In 2025, Black median household income will be nearly $600 less than under the reference case, and Hispanic median household income will be about $660 less than under the reference case.
- In 2035, Black median household income will be $700 less than under the reference case, and Hispanic median household income will be $820 less.
- The cumulative loss in Black median household income over the period 2012 – 2035 will exceed $13,000.
- The cumulative loss in Hispanic median household income over the period 2012 – 2035 will exceed $15,000.

11. Implementation of the EPA regulations would result in the loss of an increasingly large number of Black and Hispanic jobs:

- In 2015, 180,000 Black jobs would be lost and nearly 250,000 Hispanic jobs would be lost.
- In 2025, more than 300,000 Black jobs would be lost and nearly 400,000 Hispanic jobs would be lost.
- In 2030, nearly 390,000 Black jobs would be lost and nearly 500,000 Hispanic jobs would be lost.

12. The EPA regulation will likely have a doubly negative impact on the living standards of Blacks and Hispanics:

- First, the regulations will decrease Black and Hispanic incomes.
- Second, they will increase the costs of the basic goods upon which Blacks and Hispanics must spend their reduced incomes.

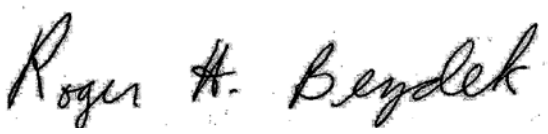
13. In the face of reduced incomes and rising prices, the trade-offs that Blacks and Hispanics will face involve reallocating spending between food, clothing, housing, and heat. Implementing the EPA regulations will force Blacks and Hispanics to spend an even more disproportionate share of their incomes -- which will have been reduced due to the effects of the CO_2 restrictions -- on basic necessities. Finally, the cumulative impact of increased unemployment, reduced incomes, and increased prices for housing,

basic necessities, energy, and utilities resulting from the EPA regulations will be to further reduce Black and Hispanic discretionary incomes.

14. The EPA regulations would significantly increase the energy burdens for Blacks and Hispanics and to force large numbers of both groups into energy poverty. Implementing the EPA GHG regulations would:

- In 2020, increase the energy burden of Blacks by 14 percent and Hispanics by 16 percent
- In 2030, increase the energy burden of Blacks by nearly one-third and Hispanics by more than 35 percent

5. I, Roger Bezdek, declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge. Executed this 9th of September, 2010.



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And/or Attorney Work Product

POTENTIAL HARM OF EPA GREENHOUSE GAS CONTROL REGULATIONS TO MINORITIES, LOW-INCOME PERSONS, THE ELDERLY, AND THOSE LIVING ON FIXED INCOMES

Prepared By

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For

Sidley Austin
Washington, D.C.

September 2010

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EXECUTIVE SUMMARY

In recent months, EPA has taken four related actions that, taken together, trigger PSD applicability for GHG sources on and after January 2, 2011.[1] These actions, the Endangerment Finding, the Johnson Memo Reconsideration, the Tailpipe Rule, and the Tailoring Rule, will affect numerous entities and lead to the most comprehensive, restrictive, and intrusive environmental regulations in U.S. history. A major impact of such regulations would be restrictions on the availability and increases in the prices of fossil fuels. The economic impacts would be serious, and this report analyzes the likely economic, employment, and energy market impacts of EPA GHG control regulations on low-income groups, the elderly, and minorities.

Major Finding

Our major finding is that the CO_2 restrictions implied in the EPA regulations would have serious economic, employment, and energy market impacts at the national level and that the impacts on low-income groups, the elderly, Blacks, and Hispanics would be especially severe. We analyze the available studies on the costs of economy-wide greenhouse gas controls. Importantly, the available analyses are all related to the cost of such controls implemented by legislation -- through cap-and-trade proposals. Consequently, our findings tend to understate the harm that these EPA regulations will cause to affected groups for two reasons:

- First, as explained in the Appendix, the legislation that has been analyzed contained numerous subsidy, rebate, compensation, and incentive provisions to lessen the burden of the CO_2 restrictions – at least in the short run. The impending EPA GHG regulations contain no such provisions.
- Second, the consensus of government and independent experts is that the type of command-and-control regulations that EPA is adopting impose far greater costs than those imposed by a market-based system.
    - The Congressional Budget Office found that "Incentive-based approaches can reduce emissions at a lower cost than more restrictive command-and-control approaches because they provide more flexibility about where and how emission reductions are achieved."[2]
    - William Pizer, Dallas Burtraw, Winston Harrington, Richard Newell, and James Sanchirico found that "using non-market policies can raise cost by a factor of ten".[3]

Implementation of the EPA regulations would:

- Significantly reduce U.S. GDP every year over the next two decades, and by 2030 GDP would be about $500 billion less than in the reference case – which assumed no EPA carbon restrictions

- Significantly reduce U.S. employment over the next two decades, and by 2030 would result in the loss of 2.5 million jobs
- Significantly reduce U.S. household incomes over the next two decades, and by 2030 average household income would be reduced by about $1,200 annually

In addition, the EPA regulations would greatly increase U.S. energy costs, and by 2030 these increases (above the reference case) could total:

- 50 percent for gasoline and residential electricity prices
- 75 percent for industrial electricity prices
- 75 percent for residential natural gas prices
- 100 percent for industrial natural gas prices
- 40 percent for jet fuel and diesel prices
- 600 percent for electric utility coal prices

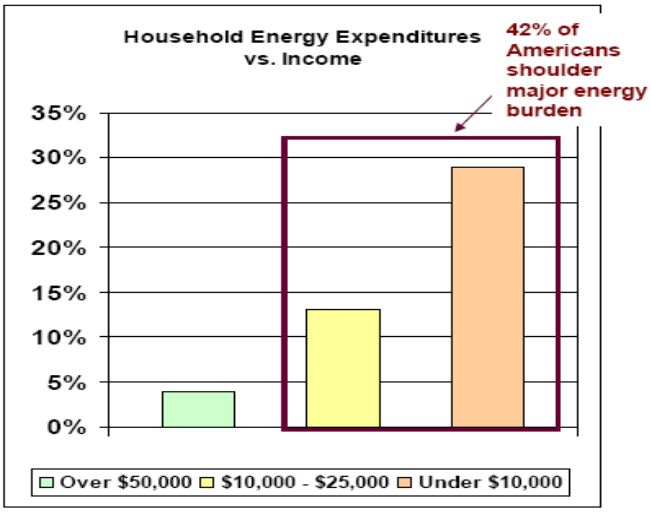
The Regressive Nature of Energy Costs

Cost increases for any basic necessity, such as energy, are regressive, since expenditures for essentials such as energy consume larger shares of the budgets of low-income families than they do for those of higher-income families. The EPA regulations will impact low income groups, the elderly, and minorities disproportionately, both because they have lower incomes to begin with, but also because they have to spend proportionately more of their incomes on energy, and rising energy costs inflict great harm on these groups. Whereas higher-income families may be able to trade off luxury goods in order to afford the higher cost of consuming a necessity such as energy, low-income families will be forced to trade off other necessities to afford the higher-cost good. Thus, when families with income constraints are faced with rising costs of essential energy, they are increasingly forced to choose between paying for that energy use and other necessities such as food, housing, or health care. Because all of these expenditures are necessities, families who must make such choices face sharply diminished standards of living.

Energy Burden

The “energy burden” is defined as the percentage of gross annual household income that is used to pay annual residential energy bills, and it is a function of income and energy expenditures. Since residential energy expenditures increase more slowly than income, lower income households have proportionately higher energy burdens. High burden households are those with the lowest incomes and highest energy expenditures. As shown in Figure EX-1, for 42 percent of households – mostly senior citizens, single parents, and minorities – increased energy costs force hard decisions about what bills to pay: Housing, food, education, health care, and other necessities.

Figure EX-1



Source: American Association of Blacks in Energy.

Impacts on the Elderly

Energy Costs and the Elderly

The increased cost of energy has been consuming a larger share of typical family budgets over the past decade and is imposing disproportionate energy cost burdens on elderly households – burdens that will be exacerbated by the impending EPA GHG regulations. Lower-income elderly households that depend mainly on fixed incomes are among those most vulnerable to energy price increases, for housing, food, health care, and other necessities must compete with energy costs for a share of the family budget. Older households account for approximately 20 percent of total U.S. consumption of energy-related products, but they are disproportionately affected by higher energy costs. Among older households, lower-income elderly spend significantly more as a share of income for energy-related services compared to those with higher incomes.

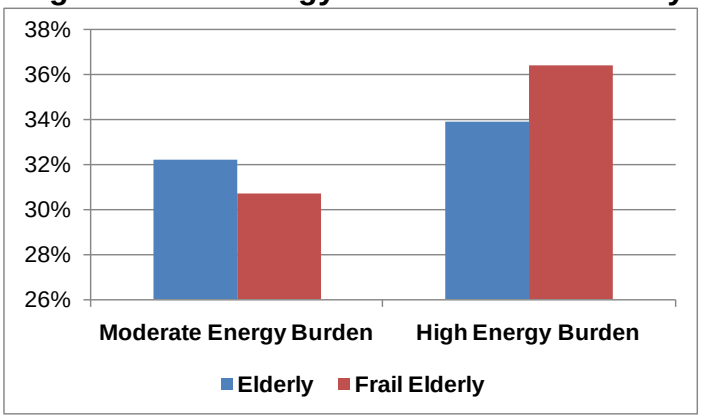
Home energy costs comprise a large portion of elderly household budgets, and exceedingly volatile natural gas, electricity, and fuel oil prices in recent years have significantly increased the energy burden facing many elderly consumers. Older consumers are particularly vulnerable to rapid increases in energy prices, and about one of every four low-income older households spends 15 percent or more of its entire income on home energy bills. Too often the low-income elderly risk their health or comfort by choosing between cutting back on energy expenditures and reducing spending for other necessities.

The Energy Vulnerability and Energy Burden of the Elderly

Senior citizens are particularly vulnerable to energy price increases due to their relatively low incomes, and older consumers with the lowest incomes will experience the greatest cost burdens from the EPA regulations. As shown in Figure EX-2, large

percentages of the elderly have high energy burdens, and nearly 34 percent of the elderly and more than 36 percent of the frail elderly have high energy burdens

Figure EX-2: Energy Burdens of the Elderly



Source: Division of Energy Assistance, U.S. Department of Health and Human Services.

Low income senior citizens dependent primarily on retirement income have especially high energy burdens: About 45 percent of such individuals have high energy burdens, as compared to about 36 percent of all low income persons. Thus, the greatest burdens of the increased energy costs resulting from EPA GHG regulations will fall on households of elderly Social Security recipients – more than 20 percent of all households -- who depend mainly on fixed incomes, with limited opportunity to increase earnings from employment. The diversion of increased shares of family incomes to energy costs implied by the EPA GHG regulations will reduce available funds for other necessities, such as housing and health care, and will diminish quality of life and the ability to save and invest for future needs.

Energy-Related Health Risks to the Elderly

The low-income elderly are particularly susceptible to weather-related illness such as potentially-fatal hypothermia, and a high energy burden can represent a life-threatening challenge. Given their susceptibility to temperature-related illnesses, elderly households tend to require more energy to keep their homes at a reasonable comfort level. However, despite this requirement, low-income elderly households spend 16 percent less on residential energy than all households. Implementation of the EPA GHG regulations would place many elderly households at serious risk by forcing them to heat and cool their homes at levels that are inadequate for maintenance of health. In the summers, the dangers from loss of cooling are particularly acute for the elderly. Finally, senior homeowners may be forced to sell their homes because they cannot afford their energy bills.

Elderly Americans' limited budgets are stretched even further by higher health care expenditures, being unable to afford home energy can be harmful to the health of household members, and many persons are forced to purchase less medicine and

health care when their utility bills are too high. A 2009 survey of low-income persons found that due to energy costs:

- 41 percent were forced to defer or forgo medical or dental care
- 33 percent were unable to afford their prescriptions
- 22 percent were unable to pay their energy bills due to medical expenses
- Nearly 30 percent became ill because their home was too cold or too hot
- 33 percent went without food for at least one day.

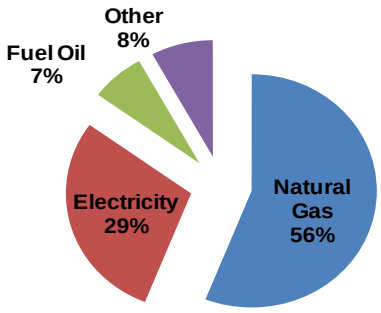
Other health hazards can occur if inside temperatures are too low or too high as a result of shut-offs or household member efforts to lower bills by reducing their use of heating and cooling sources. These temperature extremes can be damaging to the elderly, who are particularly susceptible to hypothermia (cold stress or low body temperatures) and hyperthermia (heat stress or high body temperatures), conditions that can cause illness or death.

The Elderly and Heating Costs

Over the past decade, home heating costs have been increasing as a result of an overall rise in energy costs, and energy costs have increased more rapidly than the purchasing power of low-income consumers. As a result, winter heating costs present a special burden for seniors – especially low income seniors, and this burden will be exacerbated by the impending EPA GHG regulations.

Because more than half (56 percent) of older households in the United States use natural gas as their primary heating fuel (Figure EX-3), the impact of EPA GHG regulations changes in the price of natural gas will have the biggest influence on the heating costs of older consumers. Although low-income older consumers tend to use less heating fuel than higher-income groups, higher winter heating costs are likely to be a greater burden on this group than on higher-income older consumers who have greater financial resources available to meet the increased costs.

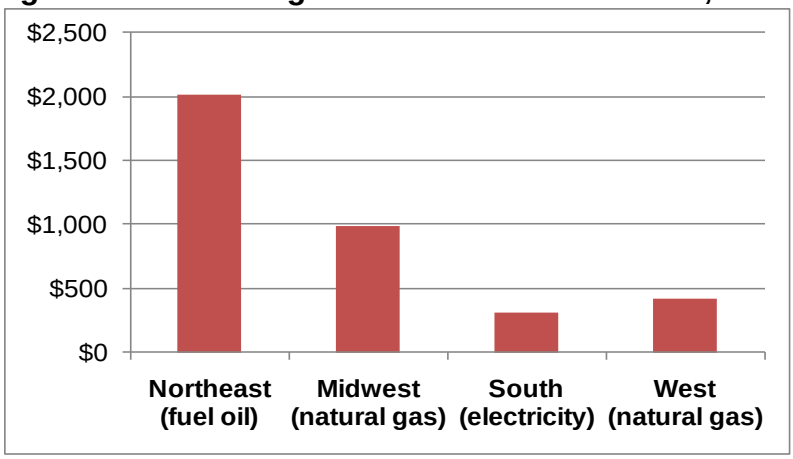
Figure EX-3: Primary Heating Fuel Used by Consumers Age 65+



Source: U.S. Energy Information Administration, Residential Energy Consumption Survey.

Heating costs also differ based on geographic location. They are highest in the Northeast and Midwest, where heating oil and natural gas are the primary heating fuels and temperatures are coldest (Figure EX-4). Many older consumers face substantial increases in their winter heating bills because of rising energy costs, and this will be exacerbated by the EPA GHG regulations. Costs will be greatest for those older consumers who use heating oil and natural gas as primary heating fuels as well as those living in the Northeastern and Midwestern census regions, and 42 percent of persons age 65 and older live in those regions. Older consumers with incomes of less than $20,000 will be especially burdened by the high winter heating costs and will find it harder to afford their winter heating bills if the EPA regulations are implemented.

Figure EX-4: Heating Costs for Consumers 65+, 2008



Source: U.S. Energy Information Administration.

Impact on Minorities

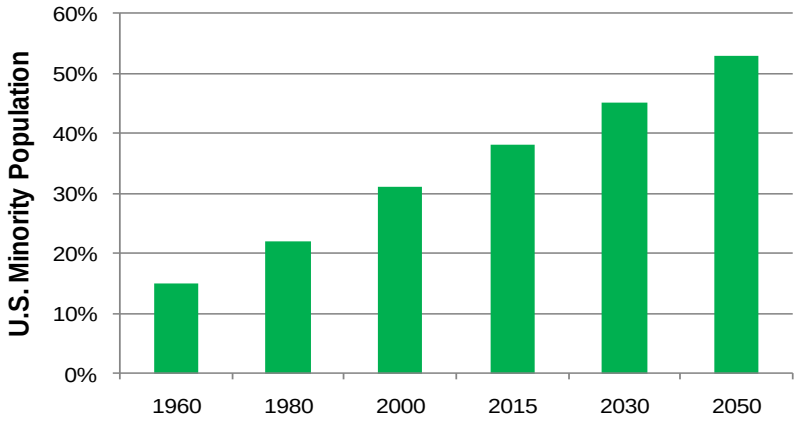
Demographic Changes

Figure EX-5 indicates that the growth in the minority population is the salient U.S. demographic development, and the portion of U.S. population that is non-Hispanic White declines from about 80 percent in 1980 to less than 50 percent in 2050.

Impact on Poverty Rates

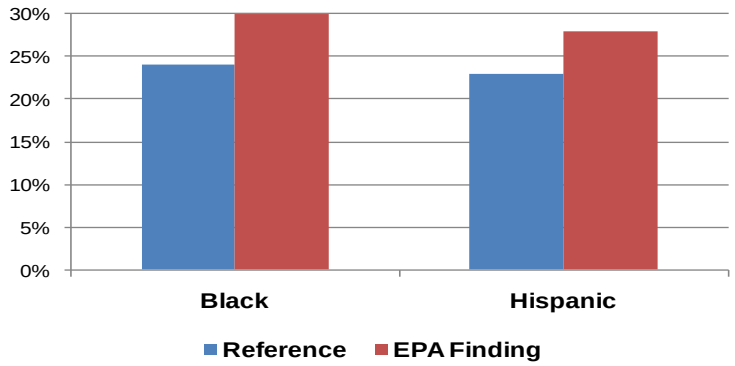
Black and Hispanics will be adversely affected threefold by the EPA GHG regulations: Their incomes will be substantially less than they would without the regulation, their rates of unemployment will increase substantially, and it will take those who are out of work longer to find another job. These impacts on earnings and employment will increase the rates of poverty among Blacks and Hispanics, and one of the impacts of implementing the EPA regulations will be to, by 2025 (Figure EX-6):

Figure EX-5: Growth in the Proportion of the U.S. Minority Population



Source: U.S. Census Bureau.

Figure EX-6
Increases in 2025 Poverty Rates Caused by the EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

- Increase the poverty rate for Hispanics from 23 percent to about 28 percent. This represents an increase in Hispanic poverty of nearly 22 percent.
- Increase the poverty rate for Blacks from 24 percent to about 30 percent. This represents an increase in Black poverty of 20 percent.

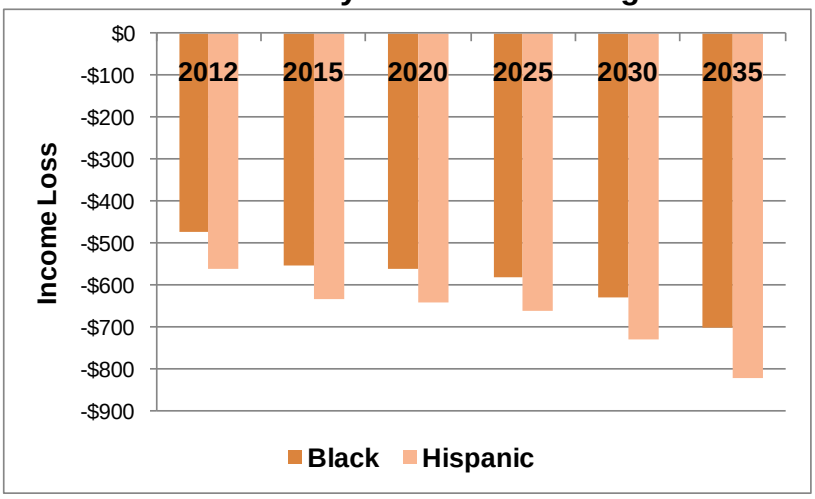
Impact on Incomes

The added costs that will result from the EPA regulations will reduce Black and Hispanic household incomes by increasing amounts each year (Figure EX-7):

- In 2015, Black median household income will decrease about $550 compared to the reference case (which assumes that the EPA regulations are not implemented), and Hispanic median household income will decrease $630 compared to the reference case.

- In 2025, Black median household income will be nearly $600 less than under the reference case, and Hispanic median household income will be about $660 less than under the reference case.
- In 2035, Black median household income will be $700 less than under the reference case, and Hispanic median household income will be $820 less.
- The cumulative loss in Black median household income over the period 2012 – 2035 will exceed $13,000.
- The cumulative loss in Hispanic median household income over the period 2012 – 2035 will exceed $15,000.

Figure EX-7
Losses in Black and Hispanic Median Household Incomes Caused by the EPA GHG Regulations



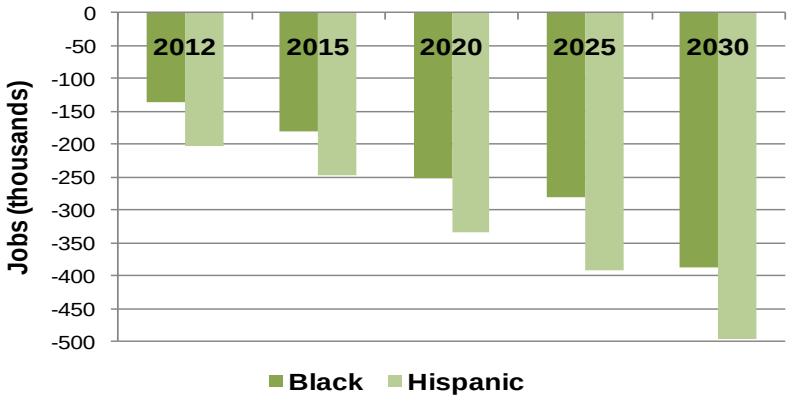
Source: Management Information Services, Inc., 2010.

Impact on Jobs

Black and Hispanic unemployment rates have consistently been much higher than average and than those for Whites. Blacks and Hispanics are also at a disadvantage in the labor force when they are employed, for they tend to be disproportionably concentrated in lower paid jobs. Nationwide, implementation of the EPA regulations would result in the loss of an increasingly large number of Black and Hispanic jobs (Figure EX-8):

- In 2015, 180,000 Black jobs would be lost and nearly 250,000 Hispanic jobs would be lost.
- In 2025, more than 300,000 Black jobs would be lost and nearly 400,000 Hispanic jobs would be lost.
- In 2030, nearly 390,000 Black jobs would be lost and nearly 500,000 Hispanic jobs would be lost.

Figure EX-8: Black and Hispanic Job Losses Caused by the EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

Impact on Basic Expenditures and Discretionary Income

Blacks and Hispanics have, on average, significantly lower incomes than Whites, and have to spend proportionately larger shares of their incomes on basic necessities such as food, housing, clothing, and utilities. Implementing the EPA regulation will significantly increase the costs of all fossil fuels and, since energy is a basic component in the production of all commodities, the prices of all goods will increase as the energy price increases work their way through the economy. Thus, the EPA regulation will likely have a doubly negative impact on the living standards of Blacks and Hispanics:

- First, the regulations will decrease Black and Hispanic incomes.
- Second, they will increase the costs of the basic goods upon which Blacks and Hispanics must spend their reduced incomes.

In the face of reduced incomes and rising prices, the trade-offs that Blacks and Hispanics will face involve reallocating spending between food, clothing, housing, and heat. For example, proportionately:

- Blacks spend 20 percent more of their income on food, ten percent more on housing, 40 percent more on clothing, and 50 percent more on utilities than do Whites.
- Hispanics spend 90 percent more of their income on food, five percent more on housing, 40 percent more on clothing, and 10 percent more on utilities than do Whites.

Implementing the EPA regulations will exacerbate this situation by forcing Blacks and Hispanics to spend an even more disproportionate share of their incomes -- which will have been reduced due to the effects of the CO_2 restrictions -- on basic necessities.

Finally, the cumulative impact of increased unemployment, reduced incomes, and increased prices for housing, basic necessities, energy, and utilities resulting from

the EPA regulations will be to further reduce Black and Hispanic discretionary incomes. Discretionary income is the money that remains for spending or saving after people pay their taxes and purchase necessities. It is an important concept both because of the financial flexibility it gives individuals and because many businesses depend on discretionary spending for sales and profits. Implementing the EPA GHG regulations will reduce the average discretionary incomes of both Blacks and Hispanics.

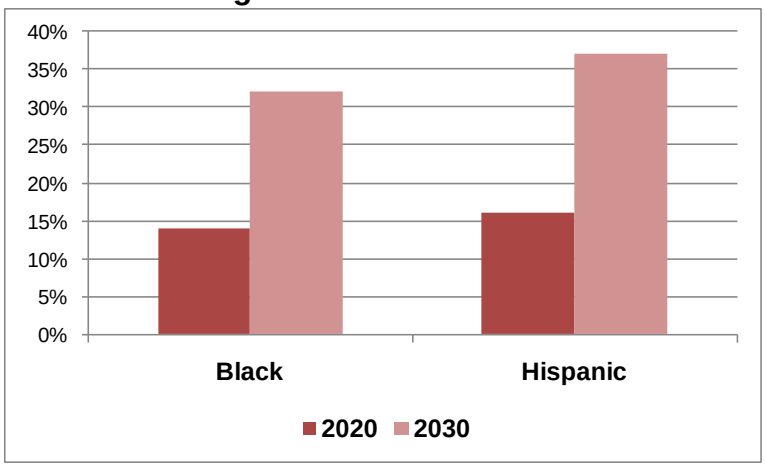
Increased Energy Poverty

One of the more serious, but less recognized effects of implementing the EPA regulations will be to significantly increase the energy burdens for Blacks and Hispanics and increase the numbers of them suffering from "energy poverty." For tens of millions of low-income households, higher energy prices will intensify the difficulty of meeting the costs of basic human needs, while increasing energy burdens that are already excessive. At the same time, the EPA regulations will threaten low-income access to vital energy and utility services, thereby endangering health and safety while creating additional barriers to meaningful low-income participation in the economy. Excessive energy burdens cause a variety of difficulties for low-income households, and "Inability to pay utilities is second only to inability to pay rent as a reason for homelessness."

A major negative effect of promulgating the EPA regulations would be to significantly increase the energy burdens for Blacks and Hispanics and to force large numbers of both groups into energy poverty. Implementing the EPA GHG regulations would (Figure EX-9):

- In 2020, increase the energy burden of Blacks by 14 percent and Hispanics by 16 percent
- In 2030, increase the energy burden of Blacks by nearly one-third and Hispanics by more than 35 percent

Figure EX-9
Increases in Black and Hispanic Energy Burdens Resulting From the EPA's GHG Rules



Source: Management Information Services, Inc., 2010.

I. INTRODUCTION

In recent months, EPA has taken four related actions that, taken together, trigger PSD applicability for GHG sources on and after January 2, 2011. These actions, the Endangerment Finding, the Johnson Memo Reconsideration, the Tailpipe Rule, and the Tailoring Rule, will affect numerous entities and lead to the most comprehensive, restrictive, and intrusive environmental regulations in U.S. history. The economic impacts in terms of GDP, incomes, industrial activity, jobs, and other indicators would likely be severe. Due to their economic vulnerability, the impacts on low-income groups, the elderly, and minorities would be disproportionate and especially serious. This report analyzes the likely economic, employment, and energy market impacts of EPA GHG control regulations on these groups.

No comprehensive analyses of the economic impacts of the EPA regulations have thus far been conducted, and here we use the results of various studies conducted in recent years on the impacts of different proposed CO_2 restriction programs and legislation. The results derived here should be viewed as conservative, indicating the minimal negative effects that may be expected for two reasons.

- First, as explained in the Appendix, the legislation that has been analyzed contained numerous subsidy, rebate, compensation, and incentive provisions to lessen the burden of the CO_2 restrictions – at least in the short run. The impending EPA GHG regulations contain no such provisions.
- Second, the consensus of government and independent experts is that the type of command-and-control regulations that EPA is adopting impose far greater costs than those imposed by a market-based system.
    - The Congressional Budget Office found that "Incentive-based approaches can reduce emissions at a lower cost than more restrictive command-and-control approaches because they provide more flexibility about where and how emission reductions are achieved."[4]
    - William Pizer, Dallas Burtraw, Winston Harrington, Richard Newell, and James Sanchirico found that "using non-market policies can raise cost by a factor of ten".[5]

Thus, the impacts of the EPA regulations on the economy and labor market are likely to be even more severe than those estimated here.

II. STUDIES OF THE IMPACTS OF CARBON REGULATION ON THE ECONOMY AND JOBS

II.A. Recent Studies

Numerous studies of the economic and jobs impacts of GHG control programs and legislation have been conducted over the past decade. We used the results of various studies conducted in recent years on the impacts of different proposed CO_2 restriction programs and legislation to estimate the impact of EPA GHG control regulations. Specifically, we relied heavily on the results of the following three studies:

- The American Council for Capital Formation (ACCF) and the National Association of Manufacturers (NAM) contracted with SAIC to analyze the American Clean Energy and Security Act (ACESA), which is designed to greatly reduce U.S. GHGs over the 2012-2050 period.[6] The study's findings indicate substantial and growing impacts to consumers and the economy of meeting the stringent emission ACESA targets through 2030. First, U.S. economic growth slows under ACESA; second, industrial production begins to decline immediately in 2012; third, employment is negatively impacted; fourth, energy prices rise over the 2012-2030 period, and finally, household income declines under ACESA, even after accounting for rebates to consumers mandated in the bill.
- The National Black Chamber of Commerce (NBCC) analyzed the economic impacts of ACESA.[7] It found that ACESA will have significant cost: Businesses and consumers would face higher energy and transportation costs under ACESA, which would lead to increased costs of other goods and services throughout the economy. As the costs of goods and services increase, household disposable income and household consumption would decline. Wages and returns on investment would also fall, resulting in lower productivity growth and reduced employment opportunities.
- A Heritage Foundation study estimated the national economic, energy, and job impacts of ASCEA.[8] It forecast that by 2035 the bill will reduce aggregate gross domestic product (GDP) by $7.4 trillion, destroy 844,000 jobs on average, raise electricity rates 90 percent after adjusting for inflation, raise inflation-adjusted gasoline prices by 74 percent, increase residential natural gas prices by 55 percent, and raise an average family's annual energy bill by $1,500.

II.B. Summary Results of Studies

As might be expected, the study findings differed depending on the specific assumptions made, the time frame studied, the level of detail included, and other factors. However, the studies all indicated that the kind of carbon restrictions contained in the EPA GHG regulations would have serious negative effects on the U.S. economy.

First, all of the studies forecast that carbon restrictions would significantly reduce U.S. GDP every year over the next two decades. For example, by 2030: ACCF/NAM estimated that ACESA would reduce U.S. GDP by more than $570 billion; NBCC estimated that ACESA would reduce U.S. GDP by about $250 billion; the Heritage Foundation estimated that ACESA would reduce U.S. GDP by $525 billion.

Second, the studies forecast that carbon restrictions would significantly reduce U.S. employment over the next two decades. For example, by 2030: ACCF/NAM estimated that ACESA would result in the loss of 2.4 million U.S. jobs; NBCC estimated that ACESA would result in the loss of 2.2 million U.S. jobs; the Heritage Foundation estimated that ACESA would result in the loss of 1.5 million U.S. jobs.

Third, the studies forecast that carbon restrictions would significantly reduce U.S. household incomes over the next two decades. For example, by 2030: ACCF/NAM estimated that ACESA would result in a reduction in average household income of about $1,250; NBCC estimated that ACESA would result in a reduction in average household income of about $900; the Heritage Foundation estimated that ACESA would result in a reduction in average household income of about $2,700

Finally, all of the studies forecast that carbon restrictions would significantly increase U.S. energy costs. This is to be expected and is the major effect of implementing the EPA regulations. The price increases would be essential to the program because they would be the most important mechanism through which businesses and households would be required to make investments and behavioral changes that reduced CO_2 emissions. Nevertheless, the rise in prices for energy and energy-intensive goods and services would be regressive and would impose a larger burden, relative to income, on low-income households than on high-income households.

The EPA regulations would reduce CO_2 emissions from all sectors of the economy -- transportation, residential, commercial, and industrial; however, as the largest emitter of CO_2, the primary impact would fall on the electric power sector. The EPA regulations would result in the electric industry shutting down most carbon-based generation or using expensive, as yet unproven technology, to capture and store CO_2. To meet the stringent EPA goals, the electric industry would also have to substitute high cost technologies, such as biomass and wind, for conventional generation.

For example, ACCF/NAM estimated that by 2030 ACESA would increase (above the 2030 reference case): Gasoline prices by 26 percent; residential electricity prices by 50 percent; industrial electricity prices by 76 percent; residential natural gas prices by 73 percent; industrial natural gas prices by 115 percent; electric utility coal prices by 760 percent. NBCC estimated that by 2030 ACESA would increase (above the 2030 reference case): Natural gas prices by 17 percent; motor fuel prices by seven percent; and electricity prices by 24 percent. The Heritage Foundation estimated that by 2030 ASCEA would increase (above the 2030 reference case): Gasoline prices by $475 per year; residential electricity prices by $500 per year; residential natural gas prices by $180 per year; heating oil prices by $50 per year.

III. ENERGY COSTS AND ENERGY BURDEN

III.A. The Regressive Nature of Energy Costs

Cost increases for any basic necessity, such as energy, are regressive in nature, since expenditures for essentials such as energy consume larger shares of the budgets of low-income families than they do for those of higher-income families. Whereas higher-income families may be able to trade off luxury goods in order to afford the higher cost of consuming a necessity such as energy, low-income families will always be forced to trade off other necessities to afford the higher-cost good. Thus, when families with income constraints are faced with rising costs of essential energy, they are increasingly forced to choose between paying for that energy use and other necessities (also often energy-sensitive) such as food, housing, or health care. Because all of these expenditures are necessities, families who must make such choices face sharply diminished standards of living.

Table 1 shows that households in the lowest-income classes spend the largest shares of their disposable income to meet their energy needs. For example, of the 8.7 million American households earning less $10,000 per year in 2008, 60 percent of the average after-tax income was used to meet those households' energy needs. Among the highest earners, the 56 million households making more than $50,000 per year, only 10 percent of the average after-tax income was spent on energy needs. The national average for energy costs as a percentage of household income is about 12 percent.[9]

Table 1: Household Energy Expenditures as a Percentage of Income, 2008

Income Category	Less than $10K	$10K-$30K	$30K-$50K	More than $50K	Totals
Households (thousands)	8,689	27,247	23,649	56,417	116,000
Avg. Pre-Tax Income	$5,359	$19,809	$39,229	$109,699	$66,570
Est. After-Tax Income	$5,171	$17,491	$32,129	$77,338	$52,586
Residential Energy Cost	$1,545	$1,883	$2,181	$2,729	$2,227
Transportation Energy Cost	$1,543	$2,618	$4,932	$4,991	$4,042
Total Energy Cost	$3,088	$4,501	$7,113	$7,720	$6,268
Energy Cost as percent of Income	59.7 percent	25.7 percent	22.1 percent	10.0 percent	11.9 percent

Source: Census Bureau, Energy Information Administration, and Congressional Budget Office.

Energy costs as a percentage of after-tax income doubled between 2001 and 2009, from a national average of 6.0 percent to 11.9 percent. For households earning less than $10,000, this has meant an increase of $1,525 in energy costs. Thus, in 2008 just the *increase* in energy prices since 2001 consumed 30 percent of the after-tax income for households in this category. This impact is much less pronounced in other income classes, as can be seen from Table 2. However, while the share of disposable income that is consumed by the *increase* in energy prices declines to 6.5 percent for the

average household, this is still a significant cost in absolute terms – it amounts to an extra $3,403 in energy expenditures per household.

Table 2: Share of Income Consumed by Increase in Energy Prices Since 2001

Income Category	Less than $10K	$10K-$30K	$30K-$50K	More than $50K	Totals
Increase in Energy Costs Since 2001	$1,525	$2,353	$3,983	$4,190	$3,403
Increase as % of 2008 After-tax Income	29.5%	13.5%	12.4%	5.4%	6.5%

Source: Census Bureau, Energy Information Administration, and Congressional Budget Office.

These tables confirm the extremely regressive nature of rising energy prices, and increased energy costs have further encroached upon the already-strained resources of the lowest-income households. These families have experienced a diminishing quality of life as they become increasingly unable to provide for their most basic needs.

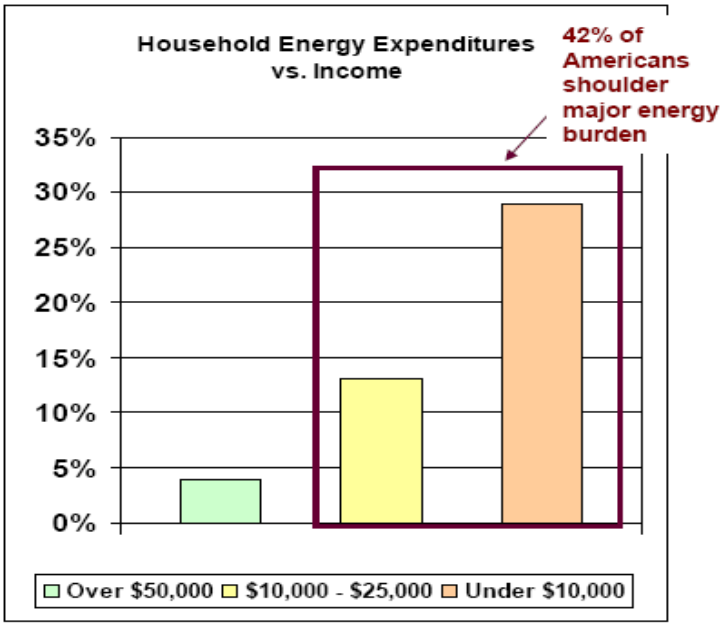
III.B. The Energy Burden

The "energy burden" is defined as the percentage of gross annual household income that is used to pay annual residential energy bills.[10] The energy burden concept can be used to compare energy expenditures among households and groups of households.[11] For example, consider the case where one household has an energy bill of $1,000 and an income of $10,000 and a second household has an energy bill of $1,200 and an income of $24,000. While the first household has a lower energy bill ($1,000 for the first household compared to $1,200 for the second), the first household has a much higher energy burden (10 percent of income for the first household compared to five percent of income for the second).

The energy burdens of low-income households are much higher than those of higher-income families, and energy burden is a function of income and energy costs. Since residential energy expenditures increase more slowly than income, lower income households have higher energy burdens. High burden households are those with the lowest incomes and highest energy expenditures. As shown in Figure 1, families earning more than $50,000 per year spent only four percent of their income to cover energy-related expenses; families earning between $10,000 and $25,000 per year (29 percent of the U.S. population) spent 13 percent of income on energy; those earning less than $10,000 per year (13 percent of population) spent 29 percent of income on energy costs.

Thus, for 42 percent of households – mostly senior citizens, single parents, and minorities – increased energy costs force hard decisions about what bills to pay: Housing, food, education, health care, and other necessities.

Figure 1



Source: American Association of Blacks in Energy.

IV. IMPACTS OF EPA GHG REGULATIONS ON THE ELDERLY

IV.A. Elderly Incomes and Elderly Poverty

In 2008, approximately 10 percent of the 38 million Americans aged 65 or older lived in poverty. While Social Security and other federal programs benefit the incomes of 30 million elderly American households -- representing 27 percent of all households -- the average Social Security income of elderly households was only about $15,000 in 2008.[12] Approximately 4 million of these elderly households received Supplemental Social Security (SSI) income averaging $7,800. Nearly 20 million households also received retirement benefits averaging $21,400. The U.S. Census Bureau reports that the median income of 25 million households with a principal householder aged 65 or older was $29,740.[13] More than 20 percent of older Americans had family incomes below 150 percent of the poverty thresholds.

Between 1959 and 1974, the elderly poverty rate fell from 35 percent to 15 percent. This was largely attributable to a set of increases in Social Security benefits. The elderly poverty rate has continued to decline in subsequent decades, and Social Security and SSI benefits continue to play a key role in reducing elderly poverty, especially among women and people of color. If Social Security benefits did not exist, an estimated 44 percent of the elderly would currently be poor.

Nevertheless, at present nearly 4 million seniors age 65 and older live below the poverty line, and millions more are barely making ends meet just above the poverty line. While about 10 percent of seniors have incomes below the poverty threshold, nearly a quarter of older Americans have family incomes below 150 percent of the poverty line.

More troubling, if there existed a more accurate measure of poverty, the elderly poverty rate would be considerably higher. The current poverty measure gives insufficient consideration to health care costs and to energy costs, and high medical bills and energy costs for the elderly can greatly reduce the income available to meet their other needs. For example, New York City has calculated its poverty rates under an improved approach proposed by the National Academy of Sciences. Among other things, it takes into account how much money people have left to meet basic needs after paying for their medical costs and other bills. Under this measure, the elderly poverty rate in New York City would have been about 33 percent in 2006, compared to less than 20 percent under the official measure.[14]

IV.B. Energy Costs and the Elderly

The increased cost of energy has been consuming a larger share of typical family budgets over the past decade, and is imposing disproportionate energy cost burdens on elderly households – burdens that will be exacerbated by the EPA GHG regulations. The average after-tax income of low- and middle-income U.S. families has remained virtually unchanged since 2001. Meanwhile, inflation has eroded about 25 percent of the value of American families' incomes.

Lower-income elderly households that depend mainly on fixed incomes are among those most vulnerable to energy price increases. Housing, food, health care, and other necessities must compete with energy costs for a share of the family budget. The approximately $30,000 median income of elderly U.S. households means that half of elderly households depend on incomes below this level. Elderly households aged 65 or older spend about the same amount on residential energy as households in the 25-34 age bracket, and have the highest per capita residential energy expenditures among all age groups.[15] EIA estimates that households with one or two adults over the age of 60 consume an average of about 750 gallons of gasoline annually, and with estimated 2010 prices, these households will spend nearly $2,200 on gasoline in 2010.[16]

Older Americans are disproportionately affected by higher energy costs – costs that the EPA regulations will greatly increase. As a share of income, households headed by a person age 65 or older spend more on energy-related expenditures than their younger counterparts. In addition, low-income households (those with less than $15,000 in household income) spent nearly 20 percent of their household income on energy-related expenditures in 2006 (the latest year for which data are available). This compares to 7.3 percent spent by older households with incomes above $15,000.

Older households account for approximately 20 percent of U.S. total consumption on energy-related products, but they are disproportionately affected by higher energy costs. Although in actual dollar terms older households spend slightly less on energy related consumption than households headed by a person under age 65, they spend a higher share of their income on energy-related expenditures. As shown in Table 3, in 2006, older households spent 9.5 percent of their income on energy-related services compared to 7.4 percent for younger households in 2006.[17]

Among older households, lower-income elderly spend significantly more as a share of income for energy-related services compared to those with higher incomes. Older households with less than $15,000 in household income spent approximately 20 percent of their income for energy-related expenditures, as compared to 7.3 percent for elderly households with incomes over $15,000 in 2006. For utilities and fuel, these same households spent 13 percent of their income to heat and operate their homes, compared to only 4.7 percent for older households with $15,000 or more in income. The $15,000 threshold for household income is a close approximation to older households that have incomes below or near 150 percent of poverty.[18] The 150 percent of poverty threshold is used by current public programs that provide low-income energy assistance to households. As noted, nearly 25 percent of older Americans have family incomes below 150 percent of the poverty thresholds.[19]

Over time, growth in energy expenditures has increased more rapidly than the incomes of older households, and older Americans with household incomes below $25,000 are significantly more likely to reduce their savings and other spending to offset higher energy prices.[20] Other alternatives that households explore in response to rising energy costs have included replacing heating and cooling systems with more energy-efficient units, installing energy-efficient windows, and purchasing more fuel-efficient cars. Although these alternatives may save costs in the longer-run, many lower-income elderly households do not have sufficient funds to purchase them.

Table 3. Average Annual Household Energy Expenditures By Age, 2006

	Age of Head of Household	
	Under 65	**65+**
Utilities and Fuel Expenditures	$1,931	$1,837
Natural Gas	$500	$507
Electricity	$1,293	$1,154
Fuel Oil and Other Fuels	$129	$176
As a share of Income	2.9%	4.8%
Transportation Expenditures		
Gasoline and Motor Oil	$2,436	$1,359
As a Share of Income	4.5%	4.7%
Local Energy Expenditures	$4,367	$3,196
As a Share of Income	7.4%	9.5%

Source: U.S. Congressional Research Service.

Home energy costs make up a large portion of elderly household budgets, and exceedingly volatile natural gas, electricity, and fuel oil prices in recent years have significantly increased the energy burden facing many elderly consumers. Older consumers are particularly vulnerable to rapid increases in energy prices and would thus be seriously affected by the price increases resulting from the EPA GHG regulations. Although they consume approximately the same amount of energy as younger people do, older Americans devote a higher percentage of total spending to residential energy costs. This is because older people spend a greater proportion of their income on home heating costs (even after adjusting for weather and home size).

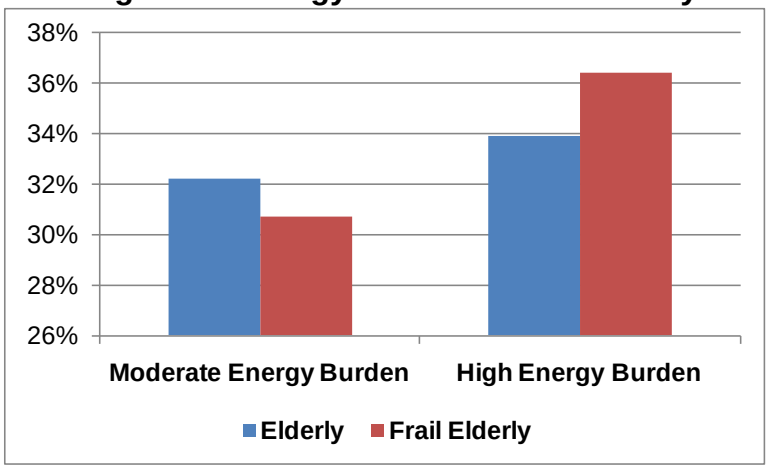
Low-income older households spend an average of 10 percent of their income on residential energy. However, about one of every four low-income older households spends 15 percent or more of its entire income on home energy bills. Too often low-income older people risk their health or comfort by choosing between cutting back on energy expenditures and reducing spending for other necessities.

IV.C. The Energy Vulnerability and Energy Burden of the Elderly

Senior citizens are particularly vulnerable to energy price increases due to their relatively low incomes. In 2008, the median gross income of 25 million senior households over 65 years was about $30,000, and seniors have the highest per capita residential energy consumption among all age categories. The average basic Social Security income of 30 million senior households was about $15,000 in 2008. For many senior households, as with other households earning less than $50,000 annually, energy price increases can force difficult choices among energy, food, and other basic necessities of life, choices that would be made more difficult by the EPA regulations.

Older consumers with the lowest incomes will experience the greatest cost burdens from the EPA regulations. Thirty-five percent of older households have total household incomes of less than $20,000, and they will experience the greatest energy burden. Although consumption data show that low-income older consumers tend to use less heating fuel than higher-income groups, higher winter heating costs are likely to be a greater burden on this group than on higher-income older consumers who have greater financial resources available to meet the increased costs. As shown in Figure 2, large percentages of the elderly have high energy burdens, and nearly 34 percent of the elderly and more than 36 percent of the frail elderly have high energy burdens

Figure 2: Energy Burdens of the Elderly



Source: Division of Energy Assistance, U.S. Department of Health and Human Services.

Low income senior citizens dependent primarily on retirement income have especially high energy burdens: About 45 percent of such individuals have high energy burdens, as compared to about 36 percent of all low income persons.[21] Thus, the greatest burdens of the increased energy costs resulting from EPA GHG regulations will

fall on households of elderly Social Security recipients – 20 percent of all households -- who depend mainly on fixed incomes, with limited opportunity to increase earnings from employment. In 2008, these households had an average Social Security income of about $14,550.

Elderly individuals with low average annual incomes are more vulnerable to increasing energy costs even if their energy consumption levels are below those for households with similar annual incomes. Unlike young working families with the potential to increase incomes by taking on part-time work or increasing overtime, fixed income seniors are largely limited to cost-of-living increases that often do not keep pace with rising energy prices. Maintaining affordable energy costs is critical to the wellbeing of millions of the nation's elderly citizens.

Senior citizens are particularly vulnerable to energy price increases that would result from the EPA GHG regulations due to their relatively low incomes. In 2008, the median gross income of 25 million senior households over 65 years was about $30,000. Seniors have the highest per capita residential energy consumption among all age categories, but lower than average transportation costs (projected at about $2,200 per household in 2010, compared to the U.S. average of $3,500). The average basic Social Security income of 30 million senior households is less than $16,000.

For many senior households energy price increases represent a serious financial burden -- for example, the elderly relying on SSI spend nearly 20 percent of their incomes on utility bills. The diversion of increased shares of family incomes to energy costs implied by the EPA GHG regulations will reduce available funds for other necessities, such as housing and health care, and diminish quality of life and the ability to save and invest for future needs.

IV.D. Energy-Related Health Risks to the Elderly

The low-income elderly are particularly susceptible to weather-related illness, and a high energy burden can represent a life-threatening challenge. Given their susceptibility to temperature-related illnesses, elderly households tend to require more energy to keep their homes at a reasonable comfort level. However, despite this requirement, low-income elderly households spend 16 percent less on residential energy than all households. Implementation of the EPA GHG regulations would place many elderly households at serious risk by forcing them to heat and cool their homes at levels that are inadequate for maintenance of health. In the summers, the dangers from loss of cooling are particularly acute for the elderly. Finally, senior homeowners may be forced to sell their homes because they cannot afford their energy bills.

Elderly Americans' limited budgets are stretched even further by higher health care expenditures. Medical spending for those between the ages of 55 and 64 is almost twice the amount spent by those between the ages of 35 and 44, and the health care expenditures of those 65 and older are even larger. Health care costs have contributed to the rise in bankruptcy filings among the elderly. More serious, being unable to afford

home energy can be harmful to the health of household members, and many persons are forced to purchase less medicine and health care when their utility bills are too high.[22] A 2009 survey of low-income persons found that due to energy costs:

- 41 percent were forced to defer or forgo medical or dental care
- 33 percent were unable to afford their prescriptions
- 22 percent were unable to pay their energy bills due to medical expenses
- Nearly 30 percent became ill because their home was too cold or too hot
- 33 percent went without food for at least one day.

For the elderly, the impact of higher energy costs on food expenditures is an especially serious problem. Nearly 18 percent of low-income elderly (with incomes below 130 percent of the poverty line) who live with others are food insecure, as are more than 12 percent of low-income seniors who live alone. And although 65 percent of individuals who are eligible for food stamps receive benefits, the participation rate among the elderly is much lower at only 30 to 40 percent.[23]

Other health hazards can occur if inside temperatures are too low or too high as a result of shut-offs or household member efforts to lower bills by reducing their use of heating and cooling sources. Thirty-one percent of households with incomes at or below 150 percent of poverty kept their homes at a temperature that they thought was unsafe or unhealthy at some point during the past year. Similarly, so did 24 percent of those between 151 percent to 250 percent of poverty.[24]

These temperature extremes can be damaging to the elderly, who are particularly susceptible to hypothermia (cold stress or low body temperatures) and hyperthermia (heat stress or high body temperatures), conditions that can cause illness or death.[25] Of the approximately 600 people who die from hypothermia each year, half are typically 65 or older,[26] and this group accounts for 44 percent of those who die from weather-related heat exposure.[27] Senior citizens are at increased risk for these conditions because they do not adjust well to sudden changes in temperature and are more likely to have medical conditions or take medications (including over-the-counter cold medications) that impair the body's response to hot and cold temperatures.[28] Thus, the EPA GHG regulations have serious implications for the health of many senior citizens.

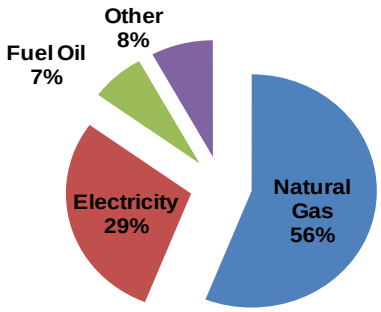
IV.E. The Elderly and Heating Costs

Over the past decade, home heating costs have been increasing as a result of an overall rise in energy costs, and energy costs have increased more rapidly than the purchasing power of low-income consumers.[29] As a result, winter heating costs present a special burden for seniors – especially low income seniors, and this burden will be exacerbated by the EPA GHG regulations.

Because more than half (56 percent) of older households in the United States use natural gas as their primary heating fuel (Figure 3), the impact of EPA GHG regulations-induced changes in the price of natural gas will have the largest influence on the heating costs of older consumers.

Although low-income older consumers tend to use less heating fuel than higher-income groups, higher winter heating costs are likely to be a greater burden on this group than on higher-income older consumers who have greater financial resources available to meet the increased costs (Table 4).

Figure 3: Primary Heating Fuel Used by Consumers Age 65+



Source: U.S. Energy Information Administration, Residential Energy Consumption Survey.

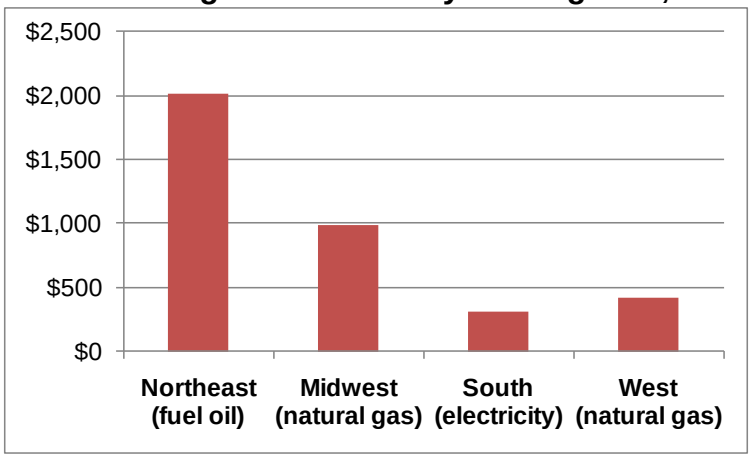
Table 4: Estimated Winter Energy Burden for Consumers Age65+, 2008

		Natural Gas		Fuel Oil		Electricity	
Income	**Percent of 65+ Population**	**Energy Burden**	**Cost**	**Energy Burden**	**Cost**	**Energy Burden**	**Cost**
$0-9999	10.4%	8.2%	$618	15.7%	$1,177	4.9%	$371
$10K – 19,999	24.6%	5.5%	$805	13.6%	$1,997	2.6%	$383
$20K – 29,999	18.9%	3.5%	$853	7.7%	$1,904	1.5%	$376
$30K – 3,999	12.7%	2.3%	$778	6.4%	$2,210	1.5%	$533
$40K – 74,999	19.6%	1.7%	$895	4.3%	$2,245	0.9%	$486
$75K +	14.0%	0.9%	$976	2.8%	$3,041	0.6%	$614
All Incomes	100%	1.7%	$819	4.2%	$2,023	0.9%	$433

Source: U.S. Energy Information Administration.

Low Income Home Energy Assistance Program (LIHEAP) recipients spend 20 percent of their annual income to pay home energy bills, while households with incomes above the LIHEAP federal maximum income standard spend only three percent of their annual income on household energy. Nearly six million low-income consumers receive government assistance for energy bills, but even at this level, the program serves less than 20 percent of eligible households.[30] Heating costs also differ based on geographic location. These costs are highest in the Northeastern and Midwestern census regions, where heating oil and natural gas are the primary heating fuels and temperatures are coldest (Figure 4).

Figure 4: Heating Costs for Consumers 65+ by Census Region and Primary Heating Fuel, 2008



Source: U.S. Energy Information Administration.

Many older consumers face substantial increases in their winter heating bills because of rising energy costs, and this will be exacerbated by the EPA GHG regulations. Costs will be greatest for those older consumers who use heating oil and natural gas as primary heating fuels as well as those living in the Northeastern and Midwestern census regions. Older consumers with incomes of less than $20,000 will be especially burdened by the high winter heating costs. Because heating expenditures are growing far faster than energy assistance spending, many older consumers earning under $20,000 will likely find it harder to afford their winter heating bills if the EPA regulations are implemented.

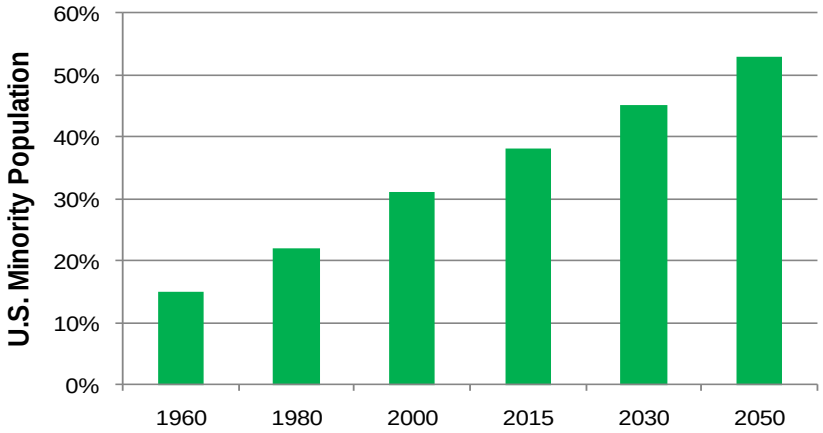
However, low-income individuals are not the only ones concerned about being able to afford their heating bills. Energy assistance administrators report that the number of individuals from higher-income groups applying for help with heating bills has increased over previous years.[31] If the EPA regulations are enacted, many older consumers may be unable to heat their homes adequately in the coming years. Thus:

- Older consumers with the lowest incomes will experience the greatest cost burdens. Thirty-five percent of older households have total household incomes of less than $20,000, and they will experience the greatest energy burden.
- Older consumers who heat with oil will experience the greatest cost increases.
- Older consumers in the Northeast and Midwest will experience the highest heating costs, and 42 percent of persons age 65 and older live in the Midwest and Northeast regions of the U.S.[32]
- Rising heating expenditures by low-income consumers far exceed available resources for low-income energy assistance programs.

V. IMPACTS OF EPA GHG REGULATIONS ON MINORITIES

The most salient U.S. demographic trend is the rapid growth of the "minority" population: As shown in Figure 5, the portion of U.S. population that is non-Hispanic White declines from about 80 percent in 1980 to less than 50 percent in 2050.

Figure 5: Growth in the Proportion of the U.S. Minority Population



Source: U.S. Census Bureau.

V.A. Income, Earnings, and Wealth of Blacks and Hispanics

The average (real) income of American families has fluctuated over the past four decades, but White income has remained significantly higher than Hispanic income or Black income:[33]

- Black incomes are only about 65 percent that of the U.S. average, and these disparities will be exacerbated if the EPA regulations are implemented.
- Hispanic incomes are only about 74 percent that of the U.S. average, and these disparities will be exacerbated if the EPA regulations are implemented.
- The income of White families is nearly twice that of Black and Hispanic families.
- The average weekly earnings of Blacks and Hispanics are significantly below those of Whites.
- The wage gap between Black workers and White workers has remained relatively constant over the past several decades.
- The average wage gap between Hispanics and Blacks and Whites has widened over the past two decades -- due, in part, to the widening gap in educational attainment between Hispanics and the rest of the population.

Incomes and earnings provide a measure of the economic differences between demographic groups. Another measure is the poverty rate and, while there are several different measures of this rate, here we use the Federal government's official definition.[34] Some of the disparities in poverty rates between the demographic groups can be explained by differences in factors such as age distribution, family structure, and educational attainment. However, substantial differences between groups exist among individuals with similar characteristics. For example, in 2008: The overall U.S. poverty rate was 13.2 percent; for non-Hispanic Whites, the poverty rate was 8.6 percent; for Hispanics it was 23.2 percent; for Blacks it was 24.7 percent.[35] Thus, the poverty rate for Blacks is slightly higher than that for Hispanics, and the poverty rates for Blacks and Hispanics are nearly twice the national average and nearly three times as high as the rate for non-Hispanic Whites.

Further, the poverty rate for Blacks and Hispanics has historically been about three times that of Whites, and poverty rates among the elderly are considerably higher for Blacks and Hispanics than for Whites. While poverty rates are relatively high for all children in single-parent families maintained by women, they are significantly higher for Hispanic and Black children than for White children in such families. Among persons aged 25 and over without a high school degree, poverty rates for Blacks and Hispanics are well above those of Whites.

Incomes, earnings, and poverty rates thus indicate that Blacks and Hispanics are significantly less well off than Whites. In addition, the net worth of White households is nearly five times that of Black and Hispanic households, and even among households with similar monthly incomes net asset holdings are far higher among non-Whites than Blacks or Hispanics.[36]

V.B. The Economic Vulnerability of Blacks and Hispanics

By virtually every measure of economic well being and security, Blacks and Hispanics are worse off than Whites, and they tend to be especially vulnerable to the economic downturn and job losses likely to result from implementing the EPA GHG regulations.[37] For example:

- Black and Hispanic family incomes are less than two-thirds the overall U.S. average, and this disparity will likely be exacerbated by implementation of the EPA CO_2 restrictions
- Black and Hispanic family incomes are significantly less than White family incomes.
- There is a large gap between the wages of Whites and those of Blacks and Hispanics, which has remained relatively constant over the past four decades.
- Poverty rates for Blacks and Hispanics have consistently been much higher than those for Whites, and are currently more than three times as high.

- The disparity in poverty rates among elderly Black and Hispanics and their White counterparts is especially marked.

Minority families have assets that are, on average, about 20 percent of those of White families, and they thus have little to cushion themselves from the economic downturn and job losses that will likely result from implementing the EPA regulations:

- Whites have, on average, a net worth that is nearly five times that of Blacks and Hispanics, and Whites are thus much better prepared to cope with economic downturns and periods of unemployment.
- Whites own a much broader range of financial assets than Blacks and Hispanics, and these assets are more than three times as large of those owned by Blacks and Hispanics. This also gives Whites a much better capacity to cope with downturns in the economy.
- Blacks and Hispanics are much less likely than Whites to have discretionary income, and the amount of discretionary income they have is less.[38]
- Blacks and Hispanics still suffer from the "last hired, first fired" syndrome, and those who are employed are generally less secure than their White counterparts. Thus, the job losses resulting from implementing the EPA regulations will be disproportionately felt by Blacks and Hispanics
- Blacks and Hispanics are disproportionately concentrated in jobs that pay the minimum wage or below.
- Blacks and Hispanics have a much lower rate of home ownership than do Whites.
- About 20 percent of Blacks lack health insurance and about one-third of Hispanics lack health insurance.

Across racial categories, minority families are statistically more likely to be found among the lowest-income households. Table 5 shows that Hispanic, and especially Black, families are disproportionately found in the lower income categories.

Table 5: Breakdown of Income Categories by Race (2008)

Income Category	Less than $10K	$10K-$30K	$30K-$50K	More than $50K	Totals
White Households	5.8 percent	21.7 percent	19.6 percent	52.9 percent	100 percent
Hispanic Households	9.2 percent	29.1 percent	25.0 percent	36.7 percent	100 percent
Black Households	15.8 percent	30.3 percent	21.7 percent	32.3 percent	100 percent

Source: U.S. Energy Information Administration.

The energy burden is even more discriminatory for low-income Blacks and Hispanics. For example: The energy burden for Black households with annual incomes less than $10,000 is four times that of the overall energy burden for non-Hispanic Whites; the energy burden for Hispanic households with annual incomes less than

$10,000 is more than three times that of the overall energy burden for non-Hispanic Whites; the energy burden for Black households with annual incomes less than $10,000 is nearly ten times that of the energy burden for non-Hispanic White households with annual earnings of more than $50,000 per year; the energy burden for Hispanic households with annual incomes less than $10,000 is eight times that of the energy burden for non-Hispanic White households with annual earnings of more than $50,000 per year. Across all household income categories, the energy burden for Black and Hispanic households is greater than that for non-Hispanic White households.

V.C. Implications for Blacks and Hispanics

The EPA GHG regulations would seriously affect U.S. consumers, since all energy-containing products and services in the average consumer's market basket would increase markedly in price. The impacts will be especially harmful to low-income persons and minorities. For example, U.S. Blacks and Hispanics are vulnerable and will experience disproportionately large negative effects:

- The unemployment rates for Blacks and Hispanics are nearly twice the national average, and those who are employed are generally less secure than their non-Hispanic counterparts. Thus, the job losses resulting from the EPA regulations are likely to disproportionately harm Blacks and Hispanics.
- Black and Hispanic incomes are only about two-thirds to three-quarters that of the U.S. average, and these disparities will be exacerbated.
- Black and Hispanic families have assets that are, on average, much smaller than those of non-Hispanic White families, and therefore they have little to cushion themselves from the impending economic and job losses.
- Blacks and Hispanics have relatively little discretionary income, and are especially vulnerable to the income losses that will result from the EPA regulations.
- Both Blacks and Hispanics are disproportionately affected by energy price increases and resulting economic disruptions, as was illustrated during the "energy crisis" of the 1970's.[39]

It is therefore especially important to estimate the impact of the EPA regulations on Blacks and Hispanics. They remain economically disadvantaged minorities and thus highly vulnerable to negative economic impacts. Further, Hispanics are the largest U.S. minority group and are also the most rapidly growing demographic group.

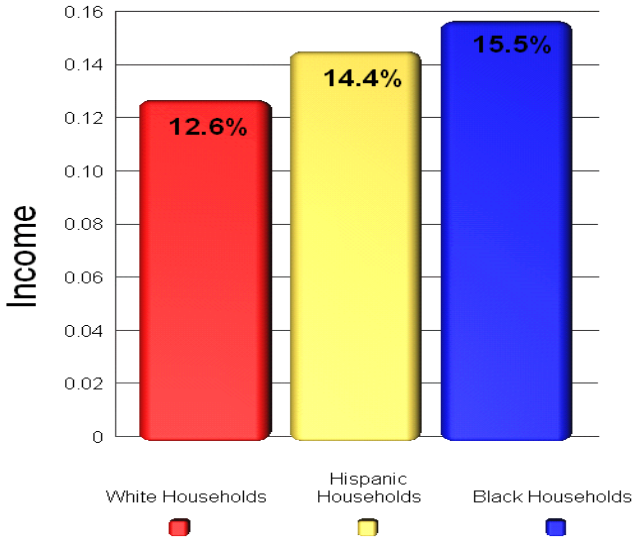
V.D. Effects on Blacks, and Hispanics

V.D.1. Impacts on Cost of Living and Poverty Rates

As discussed, one of the major effects of implementing the EPA GHG regulations will be to substantially increase the costs of energy and, especially, electricity. This will impact minorities disproportionately, both because they have lower incomes to begin with, but also because they have to spend proportionately more of their incomes on utilities and electricity. For example: Whites spend, on average, about six percent of their income on utilities, whereas Blacks spend ten percent and Hispanics spend seven percent. Whites spend, on average, about two percent of their income on electricity, whereas Blacks spend nearly four percent and Hispanics three percent.

There is an average income disparity of $15,870 between non-Hispanic white families and Hispanic families and an average income disparity of $18,165 between non-Hispanic white families and black families. Thus, the rising energy costs resulting from the EPA regulations will inflict greater harm on minority families. Lower-income families are forced to allocate larger shares of the family budget for energy expenditures, and minority families are significantly more likely to be found among the lower-income brackets. Figure 6 shows that Hispanic families must dedicate almost two percent more of their after-tax income to energy expenditures than white families. Black families must dedicate almost three percent more than white families.[40]

Figure 6: Energy Expenditures As a Percentage of After Tax Income



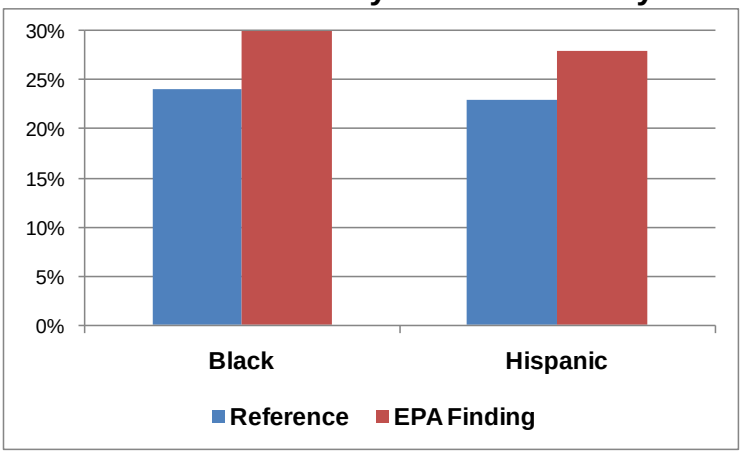
Source: U.S. Energy Information Administration.

This disparity between racial groups means that rising energy costs have a disproportionately negative effect on the ability of minority families to acquire other necessities such as food, housing, childcare, or healthcare. Essentially, the EPA regulations will have the effect of a discriminatory tax based on race.

Black and Hispanic workers -- and their families – will be adversely affected threefold if EPA GHG regulations are implemented: 1) Their incomes will be substantially less than they would without the regulation; 2) their rates of unemployment will increase substantially; and 3) it will take those who are out of work much longer to find another job. As might be expected, these impacts on earnings and employment will increase the rates of poverty among Blacks and Hispanics.

The poverty rate for Blacks is slightly higher than that for Hispanics, the poverty rates for Blacks and Hispanics are nearly twice the national average and nearly three times as high as the rate for non-Hispanic Whites. As shown in Figure 7, we estimate that one of the impacts of implementing the EPA regulations will be to, by 2025, increase the poverty rate for Hispanics from 23 percent to about 28 percent -- this represents an increase in Hispanic poverty of nearly 22 percent, and increase the poverty rate for Blacks from 24 percent to about 30 percent -- this represents an increase in Black poverty of 20 percent.

Figure 7: Increases in 2025 Poverty Rates Caused by the EPA Regulations



Source: Management Information Services, Inc., 2010.

This must be considered one of the more troubling potential impacts of the EPA regulations. While it is possible to debate specific estimates, timelines, and percentages, an unintended result of the EPA regulations will likely be to force millions of Blacks and Hispanics below the poverty line -- many of whom have only recently managed to work their way out of poverty. Further, it should also be recognized that the welfare reforms of the 1990s and the 2007 – 2009 recession have made the social safety net at both the Federal and state levels less comprehensive and much stricter. This will have unfortunate implications for those Blacks and Hispanics whose incomes are reduced below the poverty level over the next decade because of the EPA action.

In addition, the EPA CO_2 restrictions, by increasing the costs of energy and energy-intensive building materials, will also increase the costs of housing. This will seriously affect Blacks and Hispanics because they have higher housing costs and a lower rate of home ownership than Whites: Only about ten percent of Whites pay 50 percent or more of their income in housing costs; the comparable percentage for Blacks and Hispanics is about 20 percent. Whereas 25 percent of Whites pay 30 percent or

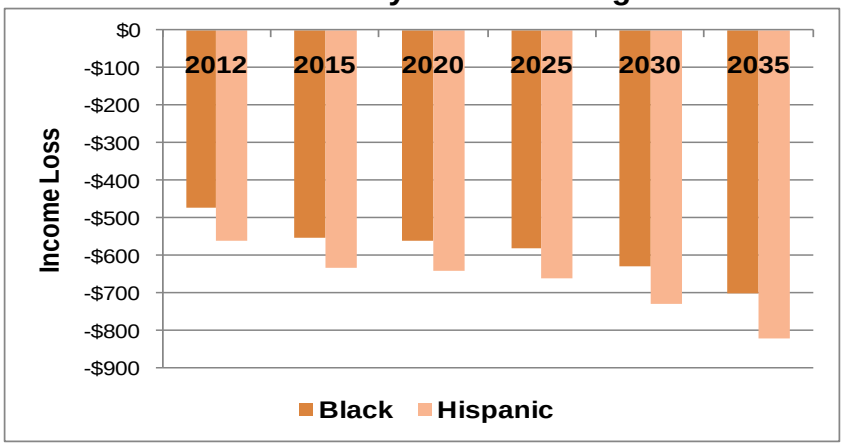
more of their income in housing costs, the comparable percent for Blacks is 40 percent, and for Hispanics it is 45 percent.[41]

V.D.2. Impacts on Incomes

Consumers and households will ultimately bear the added costs that will result from the EPA regulations. They will result in fuel switching away from less costly conventional fuels, such as coal, towards more costly lower carbon alternatives. Further, costs for all carbon-based energy sources (e.g., coal, oil, and natural gas) will increase significantly. As discussed, these added costs will reduce GDP, economic activity, and household incomes, and higher energy prices will increase prices throughout the economy and will impose increased financial costs on households.

As shown in Figure 8, implementation of EPA GHG regulations will reduce Black and Hispanic household incomes by increasing amounts each year. In 2015, Black median household income will decrease about $550 compared to the reference case (which assumes that the EPA regulations are not implemented), and Hispanic median household income will decrease more than $630 compared to the reference case. In 2025, Black median household income will be nearly $600 less than under the reference case, and Hispanic median household income will be about $660 less than under the reference case. In 2035, Black median household income will be $700 less than under the reference case, and Hispanic median household income will be $820 less. The cumulative loss in Black median household income over the period 2012 – 2035 will exceed $13,000, and the cumulative loss in Hispanic median household income over the period 2012 – 2035 will exceed $15,000.

Figure 8: Losses in Black and Hispanic Median Household Incomes Caused by EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

V.D.3. Impacts on Minority Jobs and Unemployment

Unemployment rates for Blacks and Hispanics have consistently been much higher than average and than those for Whites: The unemployment rate for Blacks has historically been about twice that of Whites, and that for Hispanics has been significantly

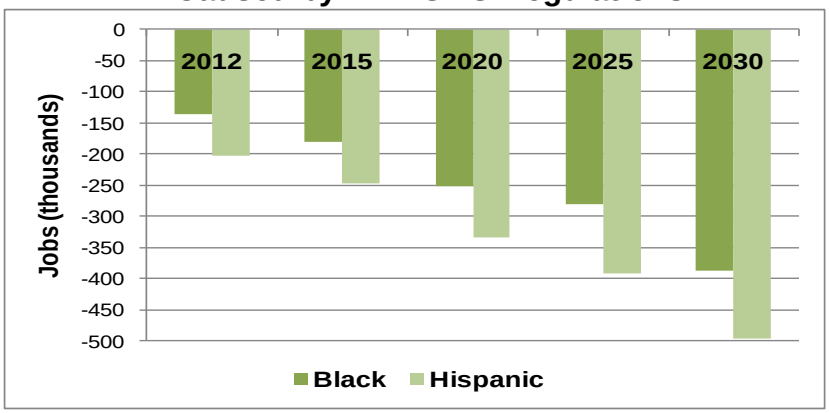
higher than that for Whites, but lower than that for Blacks. Unemployment rates for Blacks and Hispanics tend to increase more during recessions, and decrease less during recoveries than do those for Whites, and the duration of unemployment tends to be longer for Blacks and Hispanics than for Whites.[42]

Blacks and Hispanics are also at a disadvantage in the labor force when they are employed, for they tend to be disproportionably concentrated in lower paid jobs. Even when standardized for levels of education, Black workers tend to make less than their White counterparts. For example, Blacks and Hispanics are disproportionately concentrated in jobs that pay the minimum wage or below.

In addition to increased difficulty in paying home energy costs, sustained high energy prices could have an impact on the employment rate of low-wage workers. High energy prices cause businesses to cut costs by laying off workers. Experience has shown that those workers on the margin are usually the first to go, and implementation of the EPA regulations will likely result in a significant increase in unemployment among low-wage workers – who are disproportionately Black and Hispanic.

Figure 9 shows that, nationwide, implementation of the EPA regulations would result in the loss of an increasingly large number of Black and Hispanic jobs: In 2015, 180,000 Black jobs would be lost and nearly 250,000 Hispanic jobs would be lost; in 2025, more than 300,000 Black jobs would be lost and nearly 400,000 Hispanic jobs would be lost; in 2030, nearly 390,000 Black jobs would be lost and nearly 500,000 Hispanic jobs would be lost.

Figure 9: Black and Hispanic Job Losses Caused by EPA GHG Regulations

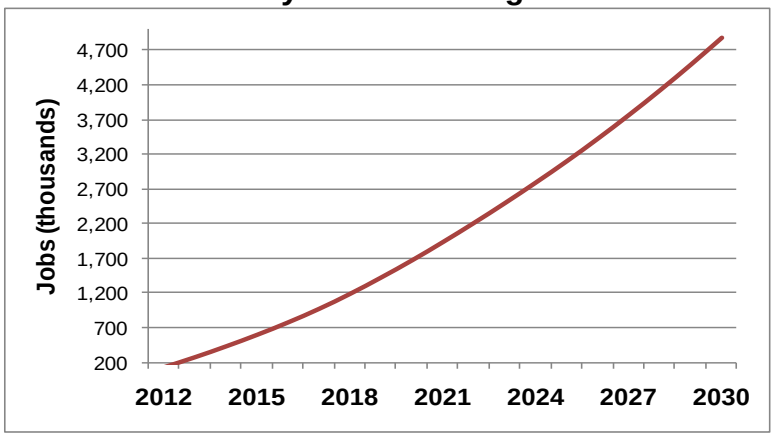


Source: Management Information Services, Inc., 2010.

The job losses increase every year and the cumulative losses for Blacks and Hispanics will increase rapidly over the next two decades if the EPA regulations are enacted. As shown in Figure 10: By 2020, cumulative job losses for Blacks will total nearly 1.7 million; by 2030, cumulative job losses for Blacks will total about 4.9 million. As shown in Figure 11: By 2020, cumulative job losses for Hispanics will total 2.4 million; by 2030, cumulative job losses for Hispanics will total more than 6.5 million.

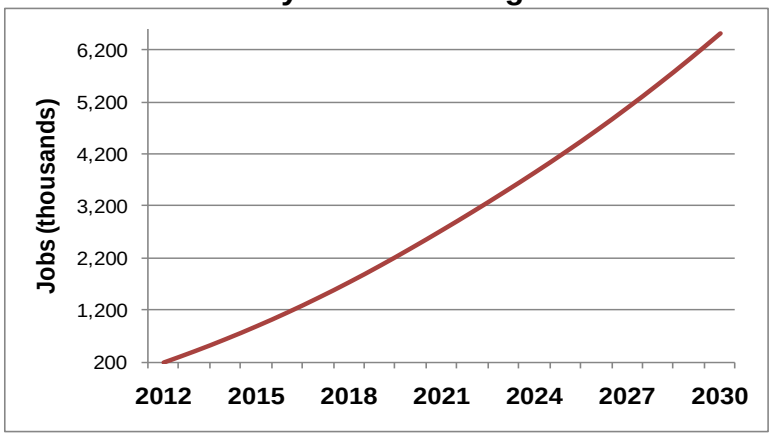
As discussed, Blacks and Hispanics have, on average, significantly lower incomes than Whites, and have to spend proportionately larger shares of their incomes on basic necessities such as food, housing, clothing, and utilities. Implementing the EPA regulations will significantly increase the costs of all fossil fuels and, since energy is a basic component in the production of all commodities, the prices of all goods will increase as the energy price increases work their way through the economy. Thus, the EPA regulations will likely have a doubly negative impact on the living standards of Blacks and Hispanics: First, implementing the regulations will decrease Black and Hispanic incomes below where they would be in the absence of the regulation; second, the regulations will increase the costs of the basic goods upon which Blacks and Hispanics must spend their reduced incomes.

Figure 10: Cumulative Black Job Losses Caused by EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

Figure 11: Cumulative Hispanic Job Losses Caused by EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

V.D.4. Impacts on Basic Expenditures and Discretionary Income

In the face of reduced incomes and rising prices, the trade-offs that Blacks and Hispanics will face involve reallocating spending between food, clothing, housing, and

heat. For example, proportionately: Blacks spend 20 percent more of their income on food, ten percent more on housing, 40 percent more on clothing, and 50 percent more on utilities than do Whites, while Hispanics spend 90 percent more of their income on food, five percent more on housing, 40 percent more on clothing, and 10 percent more on utilities than do Whites. Implementing the EPA regulations will likely exacerbate this situation by forcing Blacks and Hispanics to spend an even more disproportionate share of their incomes -- which will have been reduced due to the effects of the CO_2 restrictions -- on basic necessities.

Finally, the cumulative impact of increased unemployment, reduced incomes, and increased prices for housing, basic necessities, energy, and utilities resulting from implementation of the EPA regulations will be to further reduce Black and Hispanic discretionary incomes -- the money that remains for spending or saving after people pay their taxes and purchase necessities. It is an important concept both because of the financial flexibility it gives individuals and because many businesses depend on discretionary spending for sales and profits. Implementing the EPA regulations will reduce the average discretionary incomes of both Blacks and Hispanics.

V.D.5. Impacts of Higher Energy Burdens: Increased Energy Poverty

One of the more serious, but less recognized effects of implementing the EPA regulations will be to significantly increase the energy burdens for Blacks and Hispanics and increase the numbers of Blacks and Hispanics suffering from "energy poverty." The EPA GHG regulations will greatly increase energy prices and set off repercussions throughout the economy, but nowhere do high prices bring consequences as swiftly and harshly as in low-income and minority households. For the tens of millions of low-income households throughout the country, the higher energy prices will intensify the difficulty of meeting the costs of basic human needs, while increasing energy burdens that are already excessive. At the same time, the EPA regulations will threaten low-income access to vital energy and utility services, thereby endangering health and safety while creating additional barriers to meaningful low-income participation in the economy. While home energy costs average about four percent per year in middle class households, they can reach a staggering 70 percent of monthly income for low-income families and seniors.

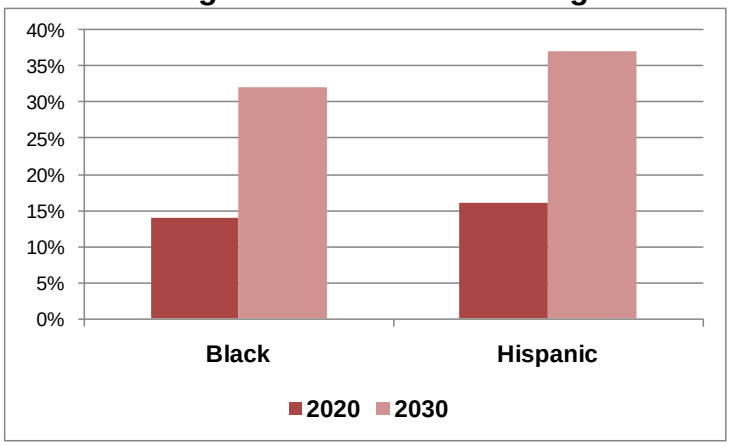
As discussed, the price increases resulting from carbon restrictions would be highly regressive -- they place a relatively greater burden on lower-income households than on higher-income ones. For example, it is estimated that the price increases resulting from a 15 percent reduction in carbon emissions would cost the average household in the lowest one-fifth of the income distribution about $560 a year, 3.3 percent of its average income. Households in the top one-fifth of the income distribution would pay an additional $1,800 a year, 1.7 percent of their average income.[43]

Low-income households have made efforts to reduce their energy consumption, but these gains have been partially offset by an increase in cooling energy consumption, a result of the increased use of air conditioning. Despite these

conservation efforts, rising costs of energy have caused energy bills to increase, particularly heating bills. From 1981 through 2005, overall energy expenditures for space heating and cooling for low-income households increased 37 percent and heating costs, the predominant portion of the total energy bill, increased 22 percent.[44]

A major negative effect of promulgating the EPA regulations would be to significantly increase the energy burdens for Blacks and Hispanics and to force large numbers of both groups into energy poverty. As shown in Figure 12, implementing the EPA regulation would: In 2020, increase the energy burden of Blacks by 14 percent and Hispanics by 16 percent; in 2030, increase the energy burden of Blacks by nearly one-third and Hispanics by more than 35 percent.

Figure 12: Increases in Black and Hispanic Energy Burdens Resulting From the EPA GHG Regulations



Source: Management Information Services, Inc., 2010.

APPENDIX: STUDIES OF THE IMPACTS OF CARBON REGULATION ON THE ECONOMY AND JOBS

Numerous studies of the economic and jobs impacts of GHG control programs and legislation have been conducted over the past decade. Some of the more significant of these are summarized below in two categories: Recent studies conducted in 2009 and 2008 of the impact of the American Clean Energy and Security Act of 2009 (ACESA) -- H.R. 2454, also known as Waxman-Markey, and recent studies of the Impact of other climate change legislation.

Recent Studies of the Impact of Waxman-Markey

American Council for Capital Formation and National Association of Manufacturers

The American Council for Capital Formation (ACCF) and the National Association of Manufacturers (NAM) contracted with SAIC to analyze ACESA.[45] ACCF/ NAM applied input assumptions under two scenarios (high cost and low cost) that

assessed the sensitivity of assumptions that have proven in the past to significantly impact the cost of limiting CO_2 emissions from energy. These input assumptions embody judgment on the likely cost and availability of new technologies in the early decades of a long-term effort to reduce GHGs as well as energy efficiency and renewable electricity standards.[46] As summarized in Table A-1, the study's findings indicate substantial and growing impacts to consumers and the economy of meeting the increasingly stringent emission targets through 2030 established by Waxman-Markey (W-M). The most significant findings are summarized below.

Table A-1: Economic Impact of the Waxman-Markey Bill on the U.S. Economy

	Baseline (ACCF-Ref)			Low Cost Case (W/M)			High Cost Case (W/M)		
	2020	2025	2030	2020	2025	2030	2020	2025	2030
GDP (Billion 2007$)	$ 18,443	$ 21,016	$ 23,802	$ 18,403	$ 20,905	$ 23,384	$ 18,374	$ 20,853	$ 23,231
Loss in GDP (Billion 2007$)				$ 40	$ 112	$ 419	$ 68	$ 164	$ 571
% Loss				0.2%	0.5%	1.8%	0.4%	0.8%	2.4%
Employment (Millions)	157.2	160.7	165.8	157.2	160.4	164.0	157.1	160.2	163.4
Job Loss (Millions)				-0.01	0.33	1.79	0.08	0.52	2.44
% Loss				0.0%	0.2%	1.1%	0.0%	0.3%	1.5%
Industrial Output (Billion 2007$)	$ 7,962	$ 8,570	$ 8,839	$ 7,817	$ 8,305	$ 8,368	$ 7,790	$ 8,254	$ 8,263
Loss in Industrial Output (Billion 2007$)				$ 144	$ 265	$ 471	$ 172	$ 316	$ 575
% Loss				1.8%	3.1%	5.3%	2.2%	3.7%	6.5%
Coal Mining Output (Billion 2007$)	$ 27.4	$ 28.6	$ 29.2	$ 17.6	$ 12.9	$ 7.5	$ 17.0	$ 12.8	$ 7.0
Loss in Coal Mining Output (Billion 2007$)				$ 9.8	$ 15.7	$ 21.7	$ 10.4	$ 15.8	$ 22.2
% Loss				36%	55%	74%	38%	55%	76%
Primary Metals (Billion 2007$)	$ 188	$ 187	$ 164	$ 176	$ 166	$ 127	$ 171	$ 158	$ 116
Loss in Primary Metals Output (Billion 2007$)				$ 12	$ 21	$ 37	$ 17	$ 29	$ 48
% Loss				6%	11%	23%	9%	15%	29%
Carbon Allowance Price (2007$ / Ton CO2)				$ 47.50	$ 76.50	$ 123.21	$ 61.24	$ 98.63	$ 158.85
Average Household Income (2007$)	$ 98,929	$ 110,009	$ 121,731	$ 98,811	$ 109,670	$ 121,001	$ 98,679	$ 109,445	$ 120,483
Loss (2007$)				(118)	(339)	(730)	(250)	(564)	(1,248)
% Change				-0.1%	-0.3%	-0.6%	-0.3%	-0.5%	-1.0%
Energy Expenditures (Billion 2007$)	$ 1,480	$ 1,549	$ 1,682	$ 1,538	$ 1,652	$ 1,996	$ 1,584	$ 1,728	$ 2,136
Increase(2007$)				$ 57	$ 103	$ 313	$ 104	$ 179	$ 454
% change				3.9%	6.7%	18.6%	7.0%	11.6%	27.0%
Retail gasoline prices (2007 $/gallon)	$ 3.61	$ 3.69	$ 3.85	$ 3.92	$ 4.13	$ 4.62	$ 4.01	$ 4.28	$ 4.86
% Change				8.4%	12.1%	20.0%	11.1%	16.1%	26.1%
Residential Electricity Price (2007$ Cents/Kwh)	$ 11.10	$ 11.22	$ 11.69	$ 11.66	$ 11.77	$ 15.36	$ 11.98	$ 12.51	$ 17.54
% change				5.0%	4.9%	31.4%	7.9%	11.5%	50.0%
Industrial Electricity Prices (2007 Cents/Kwh	$ 6.45	$ 6.57	$ 6.91	$ 7.26	$ 7.78	$ 10.30	$ 7.84	$ 8.68	$ 12.17
% change				12.5%	18.4%	48.9%	21.5%	32.0%	76.0%
Residential Natural Gas Prices (2007$/Mcf)	$ 12.88	$ 12.93	$ 14.27	$ 12.46	$ 13.55	$ 22.31	$ 12.90	$ 14.24	$ 24.75
% change				-3.3%	4.8%	56.3%	0.1%	10.1%	73.5%
Industrial Natural Gas Prices (2007 $/Mcf)	$ 7.65	$ 7.62	$ 8.85	$ 10.19	$ 12.26	$ 16.55	$ 11.56	$ 14.19	$ 18.89
% change				33.3%	61.0%	87.1%	51.1%	86.3%	113.5%
Electric Utility Coal Prices (2007 $/Ton)	$ 38	$ 39	$ 40	$ 124	$ 180	$ 269	$ 151	$ 224	$ 345
% change				224%	359%	565%	295%	472%	755%
Manufacturing Employment (Millions)	12.0	11.6	10.1	11.8	11.2	9.5	11.7	11.1	9.4
Job Loss (Millions)				0.21	0.38	0.58	0.28	0.49	0.74
% Loss				1.8%	3.3%	5.8%	2.3%	4.2%	7.3%

Source: American Council for Capital Formation and the National Association of Manufacturers, 2009.

First, U.S. economic growth slows under W-M, especially in the post 2020 period as the free emission allowances are phased out for both energy producers and energy consumers. In 2030, the inflation adjusted, annual GDP level is reduced by 1.8 percent ($419 billion) under the low cost scenario and by 2.4 percent ($571 billion) under the high cost scenario, compared to the baseline forecast.[47] Over the entire 18 year period (2012-2030) covered by the analysis, cumulative GDP losses are substantial, ranging from $2.2 trillion dollars under the low cost case to $3.1 trillion under the high cost case. The loss to federal and state budgets is large, and cumulative tax receipts will be reduced by between $670 billion and $930 billion compared to the baseline forecast.

Second, industrial production begins to decline immediately in 2012 under W-M, relative to the baseline forecast. In 2030, U.S. industrial output levels are reduced by between 5.3 percent and 6.5 percent under the low and high cost scenarios. A hallmark of economic downturns and recessions is a slowdown in the growth rate or an absolute decline in the level of industrial output. Clearly, the negative impact on industrial output of W-M would make it harder to keep the U.S. economy out of recession or prevent sluggish growth insufficient to restore job growth.

Third, employment is negatively impacted, even when additional "green" jobs are factored in. Over the 2012-2030 period, total U.S. employment averages between 420,000 and 610,000 fewer jobs each year under the low and high cost scenarios than under the baseline forecast. By 2030, there are between 1.8 and 2.4 million fewer jobs in the overall economy. Manufacturing employment is hard hit: In 2030 there are between 580,000 and 740,000 fewer jobs, or between a six and seven percent reduction in total manufacturing employment in the U.S compared to the baseline forecast. On average, over the 2012-2030 period, the manufacturing sector absorbs 59 to 66 percent of the overall job losses caused by W-M.

Fourth, energy prices rise over the 2012-2030 period, due to the various features of W-M, including prices for carbon permits, which gradually rise to between $123 and $159 dollars per ton of CO_2 by 2030 as well as the renewable portfolio standards, low carbon fuel standards, and energy efficiency standards. Over the past decade, each one percent increase in GDP in the U.S. has been accompanied by a 0.3 percent increase in energy use, thus higher energy prices will make it harder to recover from the current recession and to reduce the current high rate of unemployment. The ACCF/NAM study shows that residential electricity prices are 5 to 8 percent higher by 2020, by 2030 electricity prices are between 31 to 50 percent higher. Further, by 2030 Gasoline prices are up to 20 to 26 percent higher than under the baseline forecast.

Finally, household income drops under W-M, even after accounting for rebates to consumers mandated in the bill. In 2030, the decline in annual household income ranges from $730 in the low cost case to about $1,250 in the high cost case. However the impacts on household income in individual states, especially in the Midwest are more than 40 percent higher than the national average. For example, household income in Illinois is $1,100 lower in 2030 under the low cost case and $1,800 lower

under the high cost case. Other Midwestern states, like Michigan, Indiana, and Kansas show a similar pattern, and income losses are much higher than the national average.

The ACCF/NAM analysis of the Waxman Markey bill thus shows that there are significant economic costs in terms of slower growth in jobs, household income, and GDP from meeting the bill's GHG reduction targets. The report recommends that, given the wide recognition that without strong emission cuts in developing countries like China and India, U.S. emission reductions would have only negligible environmental benefits, policymakers should proceed cautiously as they develop climate change policies. In addition, given the size of projected federal deficits and state budget receipt shortfalls, policymakers may want to think carefully before imposing W-M bill on the already struggling U.S. economy.

National Black Chamber of Commerce, 2009

In this report the National Black Chamber of Commerce analyzed the potential economic impacts of ACESA.[48] The study examined key sections of the bill, particularly those provisions related to GHG cap-and-trade, renewable energy, and offsets, and focused on how these could affect performance of the U.S. economy.

The most important conclusion is that ACESA will have significant cost – see Table A-2. Therefore, the judgment about what action to take cannot be made simply on the grounds that a cap-and-trade program will create additional jobs and stimulate economic growth – it will not – but on whether the benefits are worth the cost. And it needs to be recognized that the benefits of any action by the U.S. alone are limited because of the relatively small share that the U.S. will contribute to global emissions over the next century.

The NBCC analysis found that businesses and consumers would face higher energy and transportation costs under ACESA, which would lead to increased costs of other goods and services throughout the economy. As the costs of goods and services rise, household disposable income and household consumption would fall. Wages and returns on investment would also fall, resulting in lower productivity growth and reduced employment opportunities. Impacts would differ across regions of the economy, depending on how local energy costs will change, whether local industries will be favored or harmed, and allocation formulas. It is not possible to avoid these costs through any free distribution of carbon allowances.

Although appropriate use of revenues from an auction or carbon tax can ameliorate impacts on some segments of the economy, the cost of bringing emissions down to levels required by the caps cannot be avoided. It is this cost of bringing down emissions that the NBCC analysis estimated, in terms of reductions in GDP and household consumption. Allocations shift who bears the burden across industries, regions, and income groups, as do decisions about how to spend or return to taxpayers the revenues from allowance auctions.

Just as it is impossible to eliminate the cost of reducing emissions to levels consistent with the cap through allocations or revenue recycling, it is impossible to bring about a net increase in labor earnings through measures that impose a net cost on the economy. NBCC found that the cap-and-trade program would lead to increases in spending on energy efficiency and renewable energy, and as a result that significant numbers of people would be employed in "green jobs." However, estimates of jobs created in these activities are incomplete if not supplemented by estimates of the reduced employment in other industries and the decline in average salaries that would result from higher energy costs and lower overall productivity in the economy.

Table A-2: Summary of Projected Economic Impacts
(change from projected baseline)

	2015	2020	2030	2040	2050
CO_2 Allowance Price (2008$/Metric Ton)	$24	$30	$49	$80	$131
Change in U.S. jobs (Millions)	-1.5	-1.8	-2.2	-3.0	-3.6
Change to Average Worker's Annual Wages: *Assumes Partial Wage Adjustment* ($2008)	-$250	-$350	-$510	-$850	-$1,250
Change in U.S. Purchasing Power ($2008 per Household)	-$760	-$810	-$880	-$990	-$1,070
Percentage Change in U.S. GDP	-0.7%	-0.8%	-1.0%	-1.3%	-1.5%
Percentage Change in Natural Gas Retail Rates*	11% ($1.30/MMBtu)	13% ($1.60/MMBtu)	17% ($2.40/MMBtu)	25% ($3.80/MMBtu)	36% ($5.70/MMBtu)
Percentage Change in Motor Fuel Cost	4% (19¢/Gallon)	5% (24¢/Gallon)	7% (38¢/Gallon)	10% (59¢/Gallon)	16% (95¢/Gallon)
Percentage Change in Electricity Retail Rates*	12% (1.3¢/ kWh)	18% (2.1¢/ kWh)	24% (2.7¢/ kWh)	41% (4.7¢/ kWh)	48% (5.8¢/ kWh)

* Percentage increases in utility bills will be smaller to the extent that there are free allowance allocations to load-serving entities and natural gas local distribution companies and/or reduced energy consumption.

Source: National Black Chamber of Commerce, 2009.

This study found that even after accounting for green jobs, there is a substantial and long-term net reduction in total labor earnings and employment. This is the unintended but predictable consequence of investing to create a "green energy future." Further, the costs estimated in this study would be much higher if it were not for the assumed use (and availability) of international offsets authorized by the bill. Specific economic impacts resulting from ACESA include the following:[49]

- ACESA would reduce GHG emissions through decreased use of conventional energy. As the cap progressively tightens with time, the cost of reducing emissions becomes more expensive and as a result, the cost of CO_2 allowances increases. In 2015, the cost of a CO_2 allowance is estimated to be $245.[50] For GHG emissions the relevant measure is metric tons of CO_2e. By 2030, the allowance

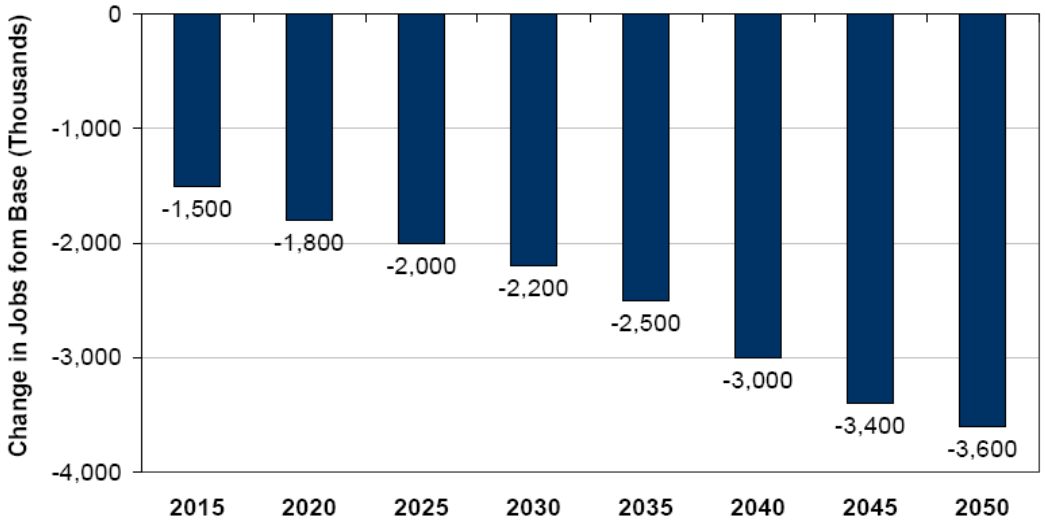
cost could increase to $49 per metric ton of CO_2 and by 2050, the allowance cost could reach $131 per metric ton of CO_2.

- Relative to energy costs in the baseline level, retail natural gas rates would rise by an estimated 11 percent ($1.30 per MMBtu) in 2015, by 17 percent ($2.40 per MMBtu) in 2030, and by 36 percent ($5.70 per MMBtu) in 2050. Retail electricity rates are estimated to increase by 12 percent (1.3 cents per kWh) relative to baseline levels in 2015, by 24 percent (2.7 cents per kWh) in 2030 and by 48 percent (5.8 cents per kWh) in 2050.[51]
- After an estimated 19 cents per gallon increase in 2015, costs of using motor fuels are estimated to increase by 7 percent (38 cents per gallon) in 2030 and by 16 percent (95 cents per gallon) in 2050, relative to baseline levels.
- A net reduction in U.S. employment of 1.5 million job-equivalents in 2015 increasing to 2.2 million in 2030 and 3.6 million in 2050. These reductions are net of substantial gains in "green jobs." While all regions of the country would be adversely impacted, Oklahoma/ Texas, the Southeast and the Midwest regions would be disproportionately affected.
- Declines in workers' wages will become more severe with time. The earnings of an average worker who remains employed would be approximately $250 less by 2015, $510 less by 2030, and $1,250 less by 2050, relative to baseline levels.
- The average American household's annual purchasing power is estimated to decline relative to the no carbon policy case by $760 in 2015, $880 in 2030, and by $1,070 in 2050. These changes are calculated against 2010 income levels (the median U.S. household income in 2007 was approximately $50,000). They would be larger if stated against projected future baseline income levels.
- In 2015, U.S. GDP is estimated to be 0.7 percent ($110 billion) below the baseline level driven principally by declining consumption. In 2030, GDP is estimated to be roughly 1.0 percent ($250 billion) below the baseline level, and in 2050, GDP is estimated to be roughly 1.5 percent ($630 billion) below the baseline level.

Despite the promise of green jobs, ACESA would inevitably depress total employment from baseline levels. The bill would divert resources now used to produce additional goods and services into the work of obtaining energy from sources that are more costly than fossil fuels. It would, therefore, lower the sum of goods and services produced by the economy and hence the output per unit of labor. Worker compensation will decline as productivity falls. Although part of the decline in total compensation will show up as a decrease in earnings per worker, many factors inhibit decreases in average compensation. Another result of lowered productivity is likely, therefore, to appear in the form of lower employment levels. Figure A-1 illustrates the employment impacts ASCEA.

The actual number of jobs that would be lost depends on whether higher-paying or lower-paying jobs are the ones that are eliminated. NBCC assumed that jobs would be shed in equal proportions across the entire wage distribution, and reported the loss in "average jobs." Figure A-1 shows that in 2015, unemployment is 1.5 million higher than in the baseline. It also shows that there would remain between about 2.5 to 3.6 million fewer average jobs in the economy far into the future relative to what would otherwise have been possible. These estimated employment impacts are inclusive of all increases in "green jobs" that will be created by ASCEA.

Figure A-1: Projected Changes To Employment Due To ACESA, Assuming Partial Wage Rate Adjustments



Source: National Black Chamber of Commerce, 2009.

Heritage Foundation, 2009

A May 2009 Heritage Foundation estimated the economic, energy, and job impacts of ASCEA at the national level.[52] This study forecast that by 2035 the bill will:

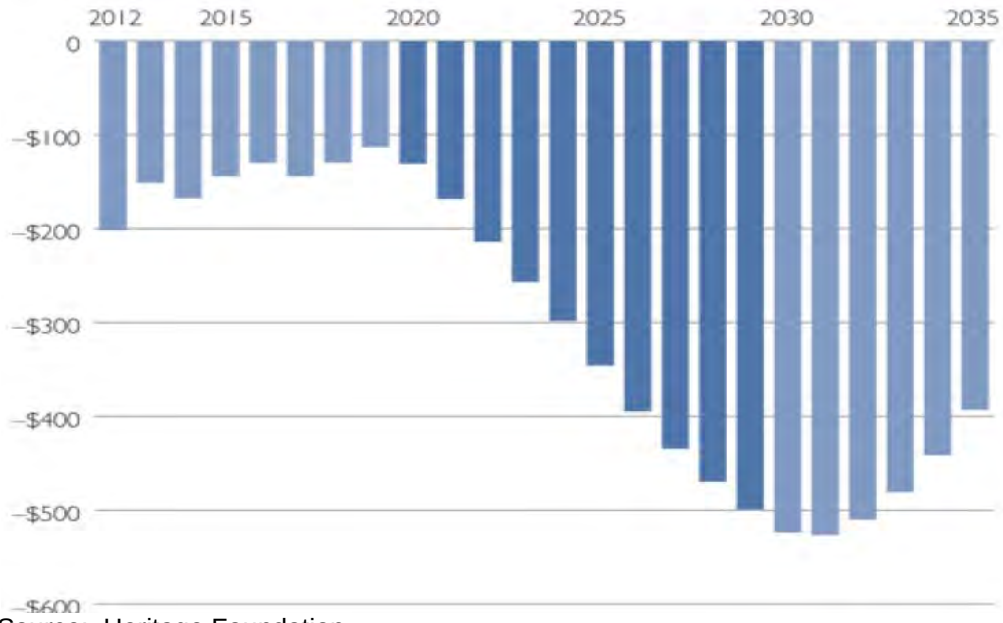
- Reduce aggregate gross domestic product (GDP) by $7.4 trillion (Figure A-2)
- Destroy 844,000 jobs on average, with peak years seeing unemployment rise by over 1,900,000 jobs
- Raise electricity rates 90 percent after adjusting for inflation
- Raise inflation-adjusted gasoline prices by 74 percent
- Raise residential natural gas prices by 55 percent
- Raise an average family's annual energy bill by $1,500
- Increase inflation-adjusted federal debt by 29 percent, or $33,400 additional federal debt per person, after adjusting for inflation

Heritage found that the 2007-2009 recession diminished near-term projections for aggregate economic activity and that as this activity declines, so does energy use.

The recession has the effect of moving the economy closer to the energy cuts needed to meet the emissions targets. Nevertheless, the income (GDP) losses are over $150 billion immediately and average nearly $300 billion per year. As the economy recovers and the caps tighten, the detrimental effect of cap and trade gets more and more severe. In the worst years, GDP losses exceed $500 billion per year.

Heritage determined that Waxman-Markey will cause higher energy costs to spread throughout the economy as producers try to cover their higher production costs by raising their product prices. Consumers will be most directly affected by rising energy bills and, even after adjusting for inflation, gasoline prices will rise 74 percent over the 2035 baseline price. Compared to the baseline, residential natural gas consumers will see their inflation-adjusted price rise by 55 percent. Because of its reliance on coal, the cost of electricity will rise by 90 percent after adjusting for inflation, and in addition to what the price would have been anyway in 2035.

Figure A-2: Change in GDP Due to ASCEA, 2012 -2035
(billions of constant 2009 dollars)



Source: Heritage Foundation

Cap and trade can work only when energy prices "skyrocket," and to force consumer-energy cutbacks, the prices need to rise significantly. The Heritage analysis showed the results of this strategy. By 2035:

- The typical family of four will see its direct energy costs rise by over $1,500 per year.
- This causes consumers to reduce electricity consumption by 36 percent.
- Even with this cutback, the electric bill for a family of four will be $754 more that year and $12,933 more in total from 2012 to 2035.

The higher gasoline prices will have forced households to cut consumption by 15 percent, but a family of four will still pay $596 more that year and $8,000 more between 2012 and 2035. In total, for the years 2012-2035, a family of four will see its direct energy costs rise by over $24,000. These inflation-adjusted numbers do not include the indirect energy costs consumers will pay as producers are forced to raise the price of their products to reflect the higher costs of production. Nor does the $24,000 include the higher expenditure for such things as more energy-efficient cars and appliances or the disutility of driving smaller, less safe vehicles or the discomfort of using less heating and cooling.

As the economy adjusts to shrinking GDP and rising energy prices, employment decreases. On average, employment is lower by 844,000 jobs, but in some years cap and trade reduces employment by more than 1.9 million jobs.

Heritage found that the negative economic impacts accumulate, and the national debt is no exception. Waxman-Markey drives up the national debt 29 percent by 2035. This is 29 percent above what it would be without the legislation and represents an additional $33,400 per person, or more than $133,000 for a family of four. These burdens come after adjusting for inflation and are in addition to the $450,000 per family of federal debt that will accrue over this period even without cap and trade. Heritage thus concluded that the impact of Waxman-Markey on the next generation of families is thousands of dollars per year in higher energy costs, over $100,000 of additional federal debt (above and beyond the increases already scheduled), a weaker economy, and more unemployment.

U.S. Environmental Protection Agency, 2009

EPA noted that the ASCEA establishes an economy wide cap and trade program and creates other incentives and standards for increasing energy efficiency and low-carbon energy. The analysis focused on the bill's cap and trade program, the energy efficiency provisions, and the competitiveness provisions.[53] Sensitivity analyses were conducted for H.R. 2454 without energy efficiency provisions, H.R. 2454 without rebates, H.R. 2454 with reference level nuclear, and H.R. 2454 with no international offsets.[54] EPA's major findings included:

- H.R. 2454 transforms energy production and consumption: Increased energy efficiency and reduced energy demand mean that energy consumption levels that would be reached in 2015 without the policy are not reached until 2040 with the policy.
- The share of low- or zero-carbon primary energy (nuclear, renewables, and CCS) rises substantially under the policy to 18 percent of primary energy by 2020, 26 percent by 2030, and 38 percent by 2050, whereas without the policy the share would remain steady at 14 percent. Increased energy efficiency and reduced energy demand reduces primary energy needs by 7 percent in 2020, 10 percent in 2030, and 12 percent in 2050.

- Offsets and electric power supply and use represent the largest sources of emissions abatement.
- Across all scenarios modeled without constraints on international offsets, the allowance price ranges from $13 to $15/$tCO_2e$ in 2015 and from $16 to $19/$tCO_2e$ in 2020.
- Across all scenarios modeled that vary constraints on international offsets, the allowance price ranges from $13 to $24/$tCO_2e$ in 2015 and from $16 to $30/$tCO_2e$ in 2020.
- Offsets have a strong impact on cost containment, and the annual limit on domestic offsets is never reached.
- While the limits on the usage of international offsets (accounting for the extra international offsets allowed when the domestic limit is not met) are not reached, usage of international offsets averages over 1 billion tCO_2e each year.
- Without international offsets, the allowance price would increase 89 percent relative to the core policy scenario.
- The cap and trade policy has a relatively modest impact on U.S. consumers, assuming the bulk of revenues from the program are returned to households. Average household consumption is reduced by 0.03-0.08 percent in 2015, 0.10-0.11 percent in 2020, and 0.31-0.30 percent in 2030, relative to the no policy case.[55]
- Average household consumption will increase by 8-10 percent between 2010 and 2015 and 15-19 percent between 2010 and 2020 in the H.R. 2454 scenario.
- In comparison to the baseline, the 5 and 10 year average household consumption growth under the policy is only 0.1 percentage point lower for 2015 and 2020.
- Average annual household consumption is estimated to decline by $80 to $111 dollars per year relative to the no policy case, which represents 0.1 to 0.2 percent of household consumption.
- These costs include the effects of higher energy prices, price changes for other goods and services, impacts on wages, and returns to capital.
- A policy that failed to return revenues from the program to consumers would lead to larger losses in consumption.

While this EPA analysis contained a set of scenarios that cover some of the important uncertainties involved in modeling the economic impacts of a comprehensive climate policy, there are still remaining uncertainties that could significantly affect the results. EPA's major economic findings are summarized in Figure A-3.

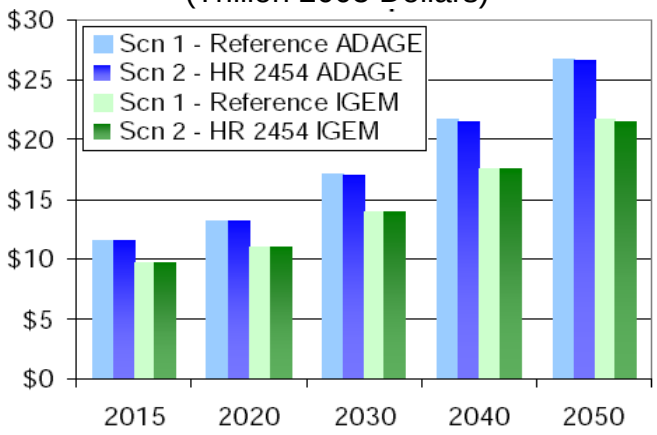
U.S. Congressional Budget Office, 2009

CBO analyzed H.R. 2454, as reported by the House Committee on Energy and Commerce on May 21, 2009, which would create a cap-and-trade program for GHG emissions.[56] It examined the average cost per household that would result from

implementing the GHG cap-and-trade program under H.R. 2454, as well as how that cost would be spread among households with different levels of income.[57]

Reducing emissions to the level required by the cap would be accomplished mainly by reducing demand for carbon-based energy by increasing its price. Those higher prices would reduce households' purchasing power, but the distribution of emission allowances would improve households' financial situation. The net financial impact of the program on households in different income brackets would depend in large part on how many allowances were sold, how the free allowances were allocated, and how any proceeds from selling allowances were used. The net impact would reflect both the added costs that households experienced because of higher prices and the share of the allowance value that they received in the form of benefit payments, rebates, tax decreases or credits, wages, and returns on their investments.

Figure A-3: U.S. Consumption
(Trillion 2005 Dollars)



Source: U.S. Environmental Protection Agency, 2009

CBO estimated that the net annual economy-wide cost of the cap-and-trade program in 2020 would be $22 billion -- about $175 per household. That figure includes the cost of restructuring the production and use of energy and of payments made to foreign entities under the program, but it does not include the economic benefits and other benefits of the reduction in GHG emissions. Households in the lowest income quintile would see an average net benefit of about $40 in 2020, while households in the highest income quintile would see a net cost of $245. Added costs for households in the second lowest quintile would be about $40 that year; in the middle quintile, about $235; and in the fourth quintile, about $340. Overall net costs would average 0.2 percent of households' after-tax income. Gross compliance costs would consist of the cost of emission allowances, the cost of both domestic and international offset credits, and the resource costs incurred to reduce the use of fossil fuels:

- The cost of the allowances. The cost of acquiring allowances would become a cost of doing business. In most cases, firms required to hold the allowances would not bear that cost; rather, they would pass it onto their customers in the form of higher prices.

- The cost of both domestic and international offset credits. Like the cost for allowances, the cost of acquiring offset credits would be passed on by firms to their customers in the form of higher prices.
- The resource costs associated with reducing emissions. The resource costs would include the value of the additional resources required to reduce emissions, by making improvements in energy efficiency, or by changing behavior to save energy.

According to CBO's estimates, the gross cost of complying with the GHG cap-and-trade program would be about $110 billion in 2020 (measured in terms of 2010 levels of consumption and income), or about $890 per household. Of that gross cost, 96 percent would be the cost of acquiring allowances or offset credits. The reminder would be the resource costs associated with reducing emissions. Although households and governments would pay for the cost of the allowances in the form of higher prices, those allowances would have value and would be a source of income. The ultimate effects of the cap-and trade program on U.S. households would depend on policymakers' decisions about how to allocate that value. Allowances would be allocated among businesses, households, and governments, and the value of those allowances would ultimately be conveyed to households in various ways:

- About 30 percent of the allowance value -- $28 billion -- would be allocated in a fairly direct manner to U.S. households to compensate them for their increased expenditures.
- Roughly 50 percent of the allowance value -- $47 billion -- would be directed to U.S. businesses to offset their increased costs.
- About 10 percent of the allowance value would be allocated to the federal government and to state governments.
- Finally, H.R. 2454 would direct the federal government to spend 7 percent of the allowance value overseas, funding efforts to prevent deforestation in developing countries, to encourage the adoption of more efficient technologies, and to assist developing countries.

Taking into the account the costs of complying with the cap ($110 billion), the allowance value that would flow back to U.S. households ($85 billion), and additional transfers and costs (providing net benefits of $2.7 billion), the net economy-wide cost of the GHG cap-and-trade program would be about $22 billion, about $175 per household -- Table A-3. Four factors account for that net cost: 1) the purchase of international offset credits ($8 billion); the cost of producing domestic offset credits ($3 billion); 3) the resource costs associated with reducing emissions ($5 billion); and 4) The allowance value that would be directed overseas ($6 billion).

Each of those components represents costs that would be incurred by U.S. households as a result of the cap-and-trade program but would not be offset by income resulting from the value of the allowances or from additional payments (such as increases in Social Security benefits) that would be triggered by the program. Estimates of the average net cost to households under H.R. 2454 do not reveal the

wide range of effects that the cap-and-trade program would have on households in different income brackets, different sectors of the economy, and different regions of the country. In order to provide greater insight into some of those variations, CBO estimated the effect of the GHG cap-and-trade program on the average household in each fifth (quintile) of the population arrayed by income.

CBO estimated that households in the lowest income quintile would see an average net benefit of about $40, while households in the highest income quintile would see a net cost of approximately $245. Households in the second lowest quintile would see added costs of about $40 on average, those in the middle quintile would see an increase in costs of about $235, and those in the fourth quintile would pay about an additional $340 per year.

Table A-3: Cost of the GHG Cap-and-Trade Program in H.R. 2454

	Total Cost (Billions of dollars)	Share of Allowance Value (Percent)	Average Cost per Household (Dollars)
Gross Costs of Complying with the Cap			
Cost of Allowances and Offsets			
Market Value of Allowances	91.4	100.0	740
Domestic and International Offsets	13.3	n.a.	110
Resource Costs	4.9	n.a.	40
Total Gross Cost	109.6	n.a.	890
Disposition of Allowance Value to Domestic Entities			
Allocation of Allowances to Households			
Low-income rebate and tax credit	-13.7	15.0	-110
LDC residential customers	-14.5	15.8	-115
Allocation of Allowances to Businesses			
Trade-exposed industries	-14.1	15.4	-115
LDC nonresidential customers	-27.1	29.7	-220
Other	-5.5	6.0	-45
Allocation of Allowances to Government			
Deficit reduction	-1.0	1.1	-10
Energy efficiency and clean energy technology	-6.9	7.5	-55
Other public purposes	-2.3	2.5	-20
Total	-85.0	93.0	-690
Other Transfers			
Low-Income Rebate and Tax Credit Not Covered by Allowance Allocation	-2.8	n.a.	-25
Automatic Indexing of Taxes and Transfers	-8.7	n.a.	-70
Net Income to Providers of Domestic Offsets	-2.7	n.a.	-20
Total	-14.3	n.a.	-115
Additional Government Costs			
Low-Income Rebate and Tax Credit Not Covered by Allowance Allocation	2.8	n.a.	25
Automatic Indexing of Taxes and Transfers	8.7	n.a.	70
Total	11.6	n.a.	95
Net Economywide Cost	21.9		175
Memorandum: Source of Net Economywide Cost			
International offsets	7.8	n.a.	65
Production cost of domestic offsets	2.7	n.a.	20
Resource costs	4.9	n.a.	40
Allowance value going overseas	6.4	7.0	50
Total	21.9	n.a.	175

Source: U.S. Congressional Budget Office, 2009.

The Brookings Institution, 2009

This 2009 report from the Brookings Institution estimated that Waxman-Markey (WM) would have severe impacts on the U.S. economy.[58] These include (prices and costs in 2008 dollars):

- An annual U.S. GDP decrease of about 1.75 percent in 2030. Based on EIA forecasts, this indicates that WM will reduce U.S. GDP in 2030 by about $430 billion -- a loss of about $3,100 per U.S. household per year – and things get worse after 2030.
- By 2018, WM would cause the loss of about 700,000 jobs.
- Inflation would be 4-5 percent higher over the next two decades.
- The impact on the coal industry would be devastating: By 2025, the cost of coal would more than double, increasing 110 percent; coal production in 2025 would be 40 percent lower, and by 2025, employment in the coal sector would decline by 50 percent.
- The petroleum sector would also be severely affected: By 2025, crude oil costs would increase 40 percent; crude oil production in 2025 would decline by more than 40 percent, and by 2025, jobs in the crude oil sector would decline by nearly 40 percent.
- CO_2 prices would increase continuously: $45/ton in 2020, $80/ton in 2030, $100/ton in 2040, and more than $120/ton in 2020.
- Allowance values increase rapidly, reaching over $320 billion per year by 2025
- Finally, over the next four decades, WM would result in a wealth transfer via allowances of $9.2 trillion.

The authors noted that the U.S. Congress continues to debate a potential cap-and-trade program for the control of GHG emissions. The economic effects of such a bill remain in dispute, with some arguing that a cap-and-trade program would create jobs and improve economic growth and others arguing that the program would shift jobs overseas and hit households with large energy price increases.

Brookings used a global economic model to evaluate different emission reduction paths and to develop insights for policymakers about how to the design the C&T program to lower the costs of achieving long-run environmental goals. The study examined GHG emissions reduction paths that are broadly consistent with proposals by President Obama and with Waxman-Markey, and also evaluated two cost minimizing paths that reach similar goals. The study estimated that alternative paths to reach an emission reduction target of 83 percent below 2005 levels by 2050:

- Reduce cumulative U.S. emissions by 38 percent to 49 percent, about 110 to 140 billion metric tons CO_2
- Reduce personal consumption by 0.3 percent to 0.5 percent -- about $1 to $2 trillion in discounted present value, 2010 to 2050

- Reduce the level of U.S. GDP by around 2.5 percent relative to what it otherwise would have been in 2050
- Reduce employment levels by 0.5 percent in the first decade, with large differences across sectors
- Create an annual value of emission allowances of over $300 billion by 2030, and a total value of over $9 trillion, 2012 - 2050

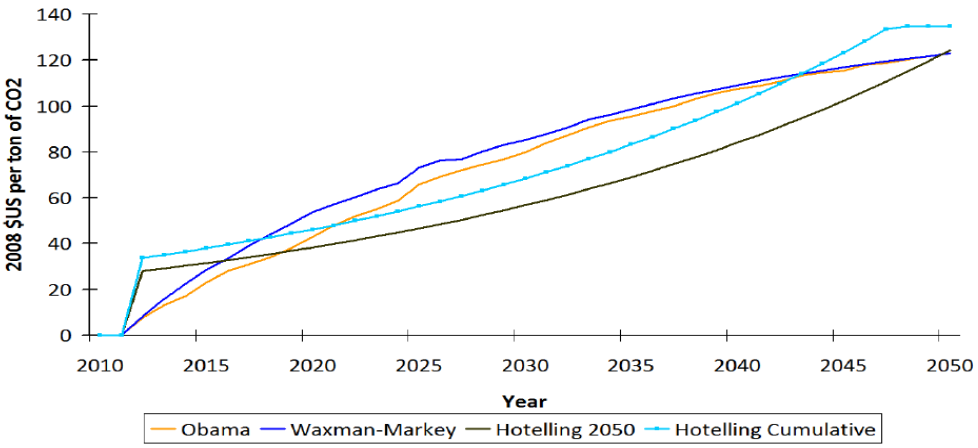
The authors examined four scenarios:

- Obama – GHG emissions 14 percent lower by 2020
- Waxman-Markey -- GHG emissions 20 percent lower by 2020 and 40 percent lower by 2030
- Hotelling 2050 -- Least cost path to 83 percent reduction by 2050
- Hotelling Cumulative -- least cost path with the same cumulative emissions as Obama

The major findings are illustrated in Figures A-4 through A-8

Carbon prices would increase continuously, from $45/ton in 2020 to more than $120/ton by 2050 – Figure A-4.

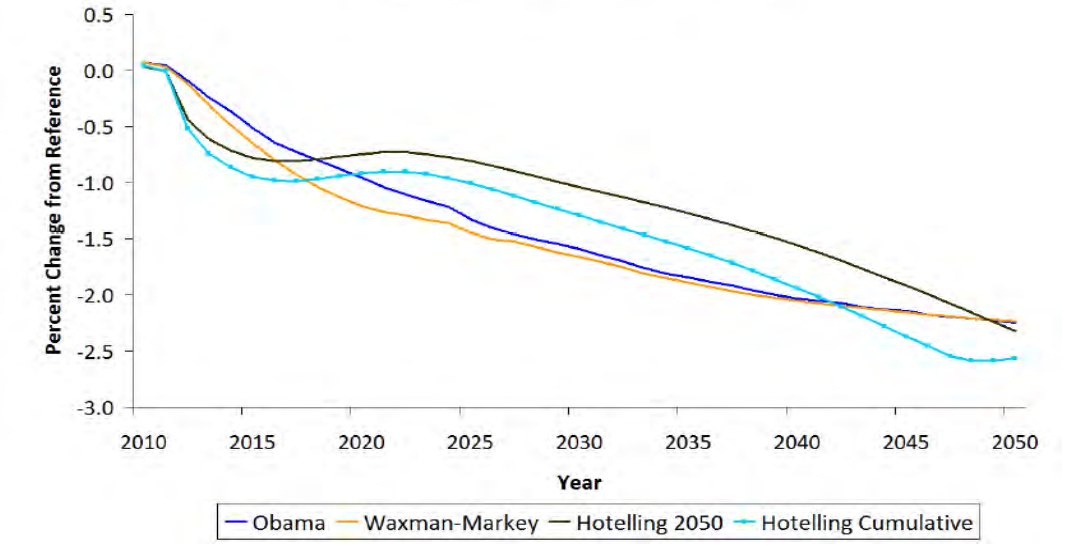
Figure A-4
Carbon Prices Under Alternative Policies



Source: The Brookings Institution, 2009

U.S. GDP would decline continuously – Figure A-5.

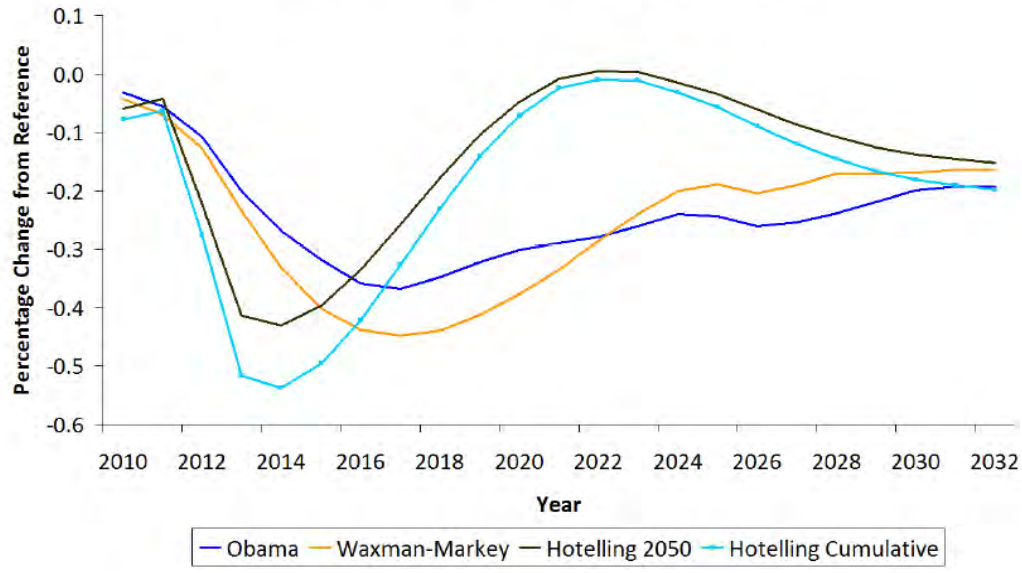
Figure A-5
Effect of Alternative Policies on US GDP



Source: The Brookings Institution, 2009

Total employment would be reduced – Figure A-6.

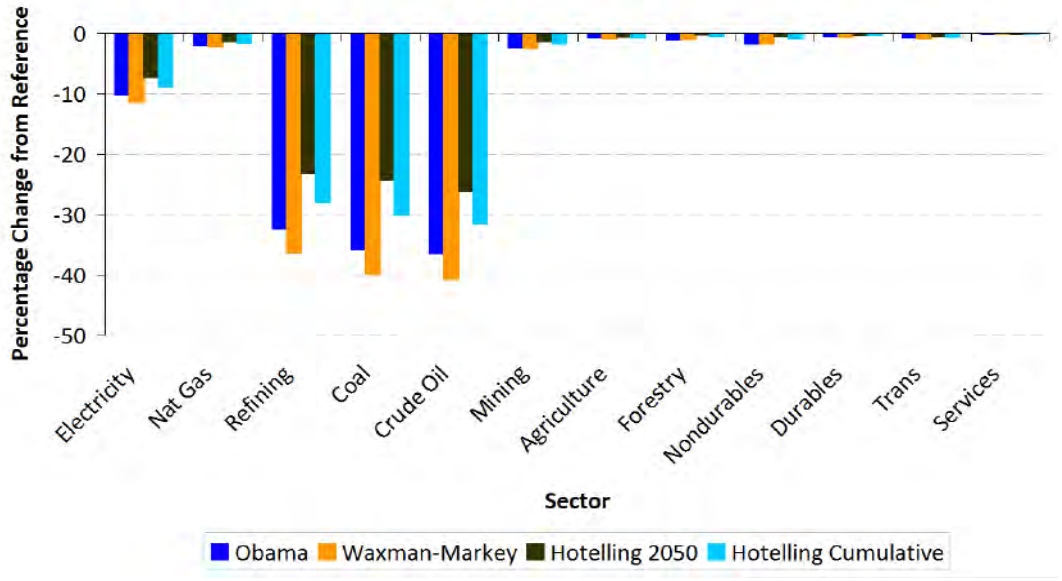
Figure A-6
Effect of Alternative Policies on US Employment



Source: The Brookings Institution, 2009

The U.S. coal and petroleum sectors would be devastated – Figure A-7.

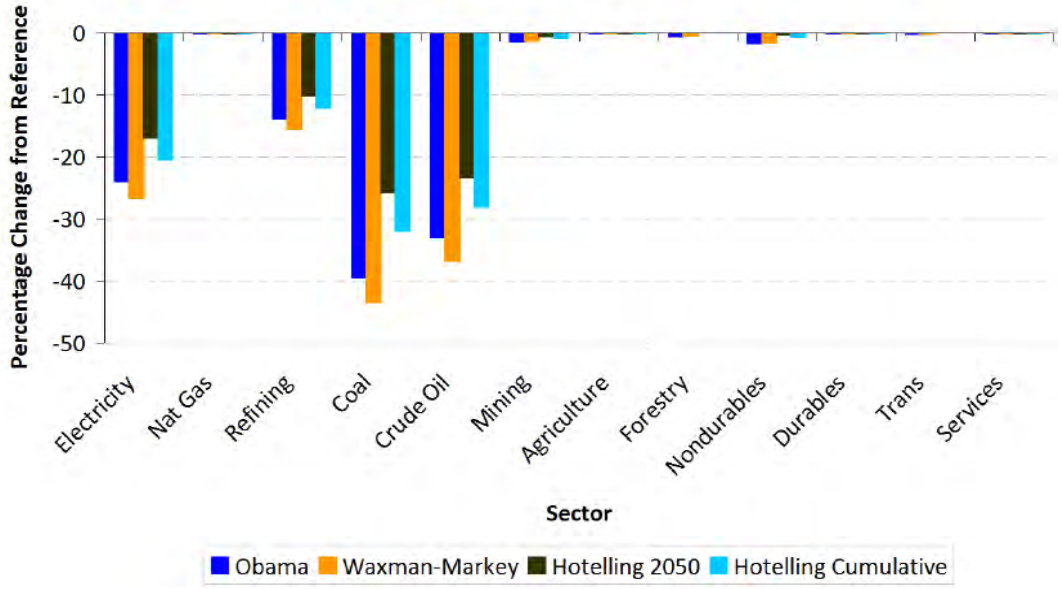
Figure A-7
Effect on Production in 2025



Source: The Brookings Institution, 2009

Employment in the U.S. domestic coal and petroleum sectors would decline drastically – Figure A-8.

Figure A-8
Effect on Employment in 2025



Source: The Brookings Institution, 2009

Recent Studies of the Impact of Climate Change Legislation

Coalition for Affordable American Energy, 2009

This CAAE report analyzed the potential economic impacts of the climate provisions contained in the Obama Administration's FY 2010 Budget Proposal.[59] The study examined the cap and trade policy described in the Administration's FY 2010 Budget Proposal, including the stated caps on U.S. GHG emissions and proposals for use of the revenues to fund renewable energy programs, the "Making Work Pay" tax credits, and other transfer payments.

The report found that these climate provisions would have significant economic and energy market impacts and that market shares would shift within the energy sector. Natural gas is projected to expand its market share, particularly for power generation. Increased imports of natural gas are estimated to supply most of the increased domestic demand for natural gas, whereas domestic natural gas production is projected to increase slightly. Both oil and coal are estimated to decline in market share. These measures would tend to lower rates of return on investments in the production of domestic oil and petroleum products. With lower rates of return, domestic investment levels would fall. Domestic crude oil and refined products production are projected to decline, while the share of renewable energy is estimated to rise.

The results also indicated that business users and consumers would face higher energy costs and the resulting higher energy production and transportation costs would lead to increased costs of goods and services throughout the economy. As these latter costs rise, household disposable income and household consumption would fall. The cap and trade policy would cause more investment in costly forms of renewable energy, thereby directing funding away from investments with greater potential to enhance productivity, and the economy would grow more slowly and job growth would decline. Overall, the economy would be expected to grow more slowly, leading to substantial differences in disposable income and personal consumption -- Table A-4. Specific economic impacts, beginning in the 2012, include the following:

- CO_2 emissions would be reduced through decreased use of conventional energy. As the cap progressively tightens, the cost of reducing emissions becomes more expensive and the cost of a carbon allowance increases. In 2015, the cost of a carbon allowance is estimated to be \$29/mtCO_2. By 2020, the allowance cost increases to \$66/mtCO_2 and by 2030 the allowance cost could reach \$116/mtCO_2.
- The cost of energy is projected to increase relative to the baseline as a result of the substitution away from less costly conventional

fuels. Natural gas demand, primarily for electricity generation, is projected to increase as coal-generated electricity is backed out due to tightening GHG emission caps, and motor fuel costs are projected to increase. After a 39 percent increase ($4.70 per MMBtu) in natural gas costs by 2020, natural gas costs increase by 56 percent ($7.20 per MMBtu) by 2025. After an estimated 48 ¢/gal increase in 2020, motor fuel costs increase 19 percent (74 ¢/gal). Electricity costs increase 27 percent (3.6 ¢/ kWh) in 2020, rising by 44 percent (5.8 ¢/kWh) in 2025.

- After an initial net job loss of 800,000 in 2015, net job losses are projected to more than double by 2020 to 1.9 million and continue to increase to 3.2 million jobs by 2025. This estimated employment impact is inclusive of jobs that would be created by the budget proposal. While all regions of the country would be adversely impacted, the Southeast, Oklahoma, Texas, and California would be disproportionately affected.
- Projected impacts on household purchasing power would be severe: Per household purchasing power is estimated to decline by $1,020 in 2015, by $1,381 in 2020, and $2,127 by 2030.
- Aggregate U.S. investment is projected to drop by 1.3 percent below the baseline level in 2015, but then is projected to increase over the 2020 – 2030 timeframe as required investments in lower emitting GHG technologies and energy efficiency improvements are put in place to comply with ever more stringent carbon caps. By 2030, investment is 5.6 percent above the baseline level. The increasingly stringent carbon caps redirect capital from higher to lower productive uses, and this shift would have a large adverse impact on productivity growth.
- By 2025, GDP is estimated to be 0.7 percent ($150 billon) below the baseline level, driven principally by declining consumption. Commercial transportation services, electric generation, and agriculture would be among the most affected sectors. In 2030, GDP is 0.2 percent ($39 billon) below the baseline level.

There would be significant changes to energy supply and consumption:

- There would be a shift towards the use of natural gas in the next decade in large measure because of increased use of natural gas for electricity generation. By 2025, U.S. demand for natural gas is estimated to increase by 3.0 Tcf relative to the baseline level. This demand increase would result in an estimated cost increase of natural gas to consumers of 56 percent ($7.20 per MMBtu) by 2025. By 2030, the impact on demand lessens to 1.5 Tcf.
- Most of the estimated natural gas demand growth would be met by imports. Increased costs for domestic oil and natural gas producers retard development of domestic natural gas resources.

By 2025, natural gas imports rise by 160 percent (2.0 Tcf) above the baseline level, whereas domestic natural gas production increases by only 5 percent (0.7 Tcf).

- The increased costs imposed on U.S. refineries to cover facility GHG emissions would not be faced by refineries outside the U.S., which would put U.S. refineries at a competitive disadvantage.
- Demand for refined products would be reduced, and this decline would fall disproportionately on U.S. producers. U.S. production of refined products is projected to decline relative to baseline levels by 604 - 2,151 MBOE/day (3.9 to 13.6 percent annually), 2020-2030.

Table A-4: Summary of Projected Economic Impacts
(Change from Projected Baseline)

	2015	2020	2025	2030
U.S. Job Losses (Millions)	0.8	1.9	3..2	3.2
Change in U.S. Household Purchasing Power ($2008 per Household)	-$1020	-$1,381	-$1,823	-$2127
Percent Change in U.S. GDP	-0.3%	-0.4%	-0.7%	-0.2%
Percent Change in U.S. Investment	-1.3%	+0.6%	+0.3%	+5.6%
Percent Change in Natural Gas Cost	16% ($1.90 /MMBtu)	39% ($4.70 /MMBtu)	56% ($7.2 0/MMBtu)	53% ($7.70 /MMBtu)
Percent Change in Motor Fuel Cost	6% (21 Cents/Gallon)	13% (48 Cents/Gallon)	19% (74 Cents/Gallon)	20% (78 Cents/Gallon)
Percent Change in Electricity Cost	15% (2 Cents/ kWh)	27% (3.6 Cents/ kWh)	44% (5.8 Cents/ kWh)	51% (6.6 Cents/ kWh)

Source: Coalition for Affordable American Energy, 2009.

Higher energy costs would cause decreases in demand for goods and services and, in addition, as the expected costs of energy services climb, the productivity of capital and labor tend to fall. Business activity is likely to contract, the demand for labor would tend to weaken, and employment is projected to decline relative to the baseline. Table A-4 illustrates that 2015 job losses are estimated to be 0.8 million, they more than double by 2020 to 1.9 million job losses, and by 2025 - 2030, job losses increase to 3.2 million. These employment impacts are inclusive of jobs that would be created. While job losses would be distributed throughout the country, the southeast, California, Oklahoma, and Texas would be disproportionately affected.

Heritage Foundation, 2008

This Heritage Foundation report estimated the economic impacts of Senate bill 2191, "America's Climate Security Act of 2007," sponsored by Joseph Lieberman (I-CT) and John Warner (R-VA).[60] S. 2191 imposes strict upper limits on the emission of six GHGs with the primary emphasis on CO_2, and would establish a cap-and-trade system. Heritage estimated the cost of S. 2191 at $800 to $1,300 per household by 2015, rising

to $1,500 to $2,500 by 2050. Electricity prices could increase 36 to 65 percent by 2015 and 80 to 125 percent by 2050.

The Heritage analysis found that S. 2191 posed extraordinary perils for the American economy. Arbitrary restrictions predicated on multiple, untested, and undeveloped technologies would lead to severe restrictions on energy use and large increases in energy costs. In addition to the direct impact on consumers' budgets, these higher energy costs will spread through the economy and inject unnecessary inefficiencies at virtually every stage of production and consumption.

S. 2191 extracts trillions of dollars from U.S. energy consumers and delivers this wealth to permanently identified classes of recipients, such as tribal groups and preferred technology sectors, while largely circumventing the normal Congressional appropriations process. Unbound by review of the normal budgetary process, this de facto tax-and-spend program threatens to become permanent --independent of the goals of the legislation. Heritage found that implementing S. 2191 will be very costly:

- Cumulative GDP losses are at least $1.7 trillion and could reach $4.8 trillion by 2030 (in inflation-adjusted 2006 dollars).[61]
- Single-year GDP losses total at least $155 billion and could exceed $500 billion (in inflation-adjusted 2006 dollars).
- Annual job losses exceed 500,000, and could approach 1,000,000.
- Annual costs of emission permits will be at least $100 billion by 2020 and could exceed $300 billion by 2030 (2006 dollars).[62]
- The average household will pay $467 more each year for its natural gas and electricity (in inflation-adjusted 2006 dollars). This means that the average household would spend an additional $8,870 to purchase energy over the period 2012 through 2030.
- The cost of the allowances will be significant and will lead to large increases in the cost of energy. Because the allowances have an economic effect much like an energy tax, the increase in energy costs creates correspondingly large transfers of income from private energy consumers to special interests.

With S. 2191, there is an initial small employment increase as firms build and purchase the newer more CO_2-friendly plants and equipment. However, any "green-collar" jobs created are more than offset by other job losses, and the initial uptick is small compared to the hundreds of thousands of lost jobs in later years. The slowdown in GDP is seen more dramatically in the decline in manufacturing output. Manufacturing benefits from the initial investment in new energy production and fuel sources, but the sector's declines are sharp thereafter. By 2020, manufacturing output is 2.4 percent to 5.8 percent below what it would be if S. 2191 never becomes law. By 2030, the manufacturing sector has lost $319 billion to $767 billion in output.

Employment growth slows sharply and potential employment decreases sharply. In 2025, nearly 500,000 jobs per year fail to materialize and job losses expand to more

than 600,000 in 2026. In no year does the economy outperform the base-line economy, and for manufacturing workers, the news is especially grim. That sector would likely continue declining in numbers thanks to increased productivity: The baseline contains a 9 percent decline between 2008 and 2030. Lieberman-Warner accelerates this decrease substantially: Employment in manufacturing declines by 23 percent over that same time period, or more than twice the rate without Lieberman-Warner.

Other, less energy-intensive sectors do not suffer such decreases. Employment in retail establishments ends the 22-year period 2 percent ahead of its 2008 level, despite significant cutbacks on household consumption levels. Employment in information businesses grows by 29 percent over this same time period. Because the distribution of energy-intensive jobs across the country is unequal, some states and congressional districts will be hit particularly hard. Notable among the most adversely affected states are Wisconsin, New Hampshire, Illinois, and Maryland.

The report concluded that the Lieberman-Warner climate change bill is, in many respects, an unprecedented proposal. Its limits on GHGs would impose significant costs on the entire American economy. In addition, complicated tariff rules, dependent on evaluating the GHG restrictions of all trading partners, add another unknowable dimension to the costs, fueling the overall uncertainty. The problems for the U.S. economy are increased by S. 2191's reliance on complex and costly technologies that have yet to be developed. The fact that this large-scale transformation of the economy must occur over relatively tight timeframes only amplifies the costs and uncertainties.

Even under optimistic assumptions, the economic impact of S. 2191 is likely to be serious for the job market, household budgets, energy prices, and the economy overall. The burden will be shouldered by the average American. The bill would have the same effect as a major new energy tax -- only worse. In the case of S. 2191, increases in the tax rate are set by forces beyond legislative control. Under a realistic set of assumptions, the impact would be severe. More significant than the wealth destroyed by S. 2191 is the wealth transferred from the energy-using public to a list of selected special interests. The reported concluded that, overall, S. 2191 would likely be -- by far -- the most expensive environmental undertaking in history.

American Council for Capital Formation and National Association of Manufacturers, 2008

The American Council for Capital Formation (ACCF) and the National Association of Manufacturers (NAM) commissioned this report by SAIC to examine the potential costs that enactment of the Lieberman-Warner (LW) Climate Security Act (S. 2191) would impose on the U.S. economy.[63] They felt that the cost to U.S. consumers and employers of implementing GHG emission reductions is highly dependent on the market penetration achieved by key technologies and the availability of carbon offsets by 2030. Understanding the potential economic impacts at the national, state, and individual household levels can help guide choices on policy to minimize the impacts on

economic growth and maximize environmental benefits. GHG reduction policies should consider impacts on energy security, economic growth, and U.S. competitiveness.

The ACCF/NAM analysis was conducted using EIA's NEMS model, and the study applied assumptions about the cost and availability of new energy technologies, oil prices, and other key factors. It found substantial and growing impacts to consumers and the economy of meeting the increasingly stringent emission targets through 2030 established by LW. Among the study's major findings are:

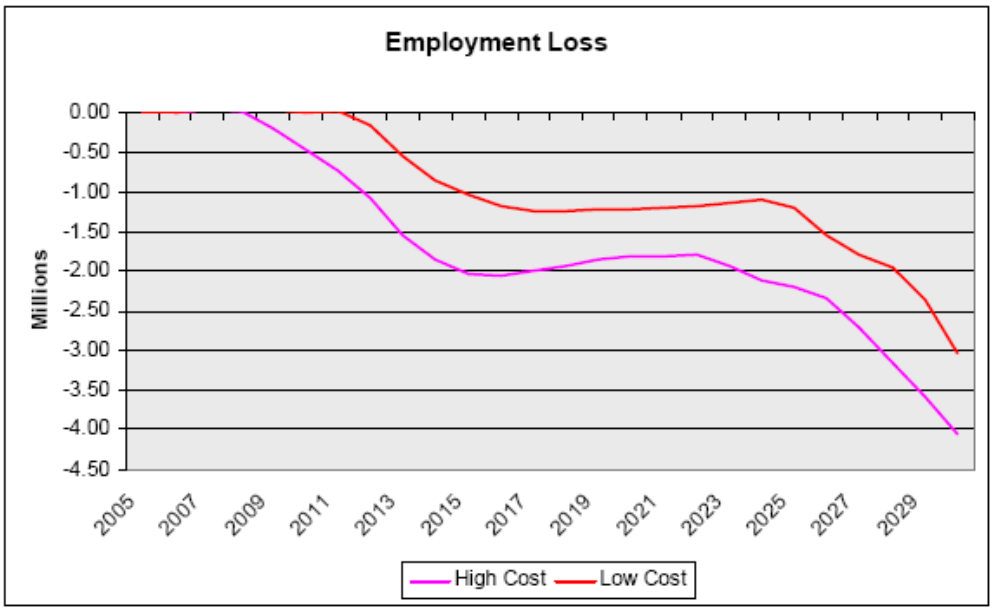
- The CO_2 emissions allowance price needed to reduce energy use to meet the S.2191 targets is estimated at $55 to $64/mt$CO_2$ in 2020, rising to between $227 to $271/mt$CO_2$ in 2030.
- The cost of the allowances raises energy prices for residential consumers by: Natural gas -- 26 percent to 36 percent in 2020, and 108 percent to 146 percent in 2030; Electricity -- 28 percent to 33 percent in 2020, and 101 percent to 129 percent in 2030.
- These increased costs slow the economy by $151 - $210 billion in 2020 and $631 - $669 billion in 2030 (2007 dollars). This causes job losses of 1.2 - 1.8 million in 2020 and 3 - 4 million by 2030.
- Manufacturing slows: The value of shipments falls by 3.2 percent to 4 percent in 2020 and in 2030 by 8.3 - 8.5 percent. Higher energy costs, lower economic activity, and fewer jobs in turn lowers average household income by $739 - $2,927 in 2020 and between $4,022 and $6,752 in 2030 (2007 dollars).

Obtaining allowances becomes a cost of doing business for firms subject to the CO_2 cap. However, those firms would not ultimately bear most of the costs of the allowances. Instead, they would pass along most costs to their customers in the form of higher prices. By attaching a cost to CO_2 emissions, a cap-and-trade program would thus lead to price increases for energy and energy-intensive goods and services. Such price increases would stem from the restriction on emissions and would occur regardless of whether the government sold emission allowances or gave them away. The price increases would be essential to the success of a cap-and-trade program because they would be the most important mechanism through which businesses and households were encouraged to make investments and behavioral changes that reduced CO_2 emissions. The rise in prices for energy and energy-intensive goods and services would be regressive and would impose a larger burden, relative to income, on low-income households than on high-income households.

The study's key finding is that S. 2191 would cause significant employment loss due to the loss of revenues resulting from higher fuel and electricity costs. In 2020, job loss is projected to range from 1.2 million to 1.8 million jobs/year, and from 3 million jobs to 4 million jobs in 2030. Under S. 2191 the U.S. economy would begin to shed approximately 850,000 jobs a year by 2014 under the low cost scenario (Figure A-8). This is primarily a result of higher carbon prices resulting in higher fuel costs for industry and higher cost to industry to comply with emissions limits. As the cap becomes more

restrictive and the economy has less freedom to deal with reducing emissions, carbon prices and fuel prices increase rapidly, leading to greater job losses of between 1.2 and 1.8 million jobs in 2020 and between 3 and 4 fewer million jobs in 2030. These job losses are net of the new jobs which may be generated by increased spending on renewable energy, energy efficiency, and carbon capture and storage.

Figure A-8: Estimated Job Losses from Lieberman-Warner



Source: American Council for Capital Formation and National Association of Manufacturers, 2008.

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ENDNOTES

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[6]American Council for Capital Formation and the National Association of Manufacturers, *Analysis of the Waxman-Markey Bill "The American Clean Energy and Security Act of 2009" (H.R. 2454)*, August 2009. This study uses the NEMS/ACCF-NAM 24 model. The ACCF-NAM analysis of the Waxman-Markey bill used the most recent version of the EIA *Annual Energy Outlook*, the April AEO 2009.
[7]National Black Chamber of Commerce, *Impact on the Economy of the American Clean Energy and Security Act of 2009 (H.R.2454)*, report prepared by CRA International, May 2009 (updated August 2009).
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[35]"Who is Poor?" Institute for Research on Poverty, University of Wisconsin -- Madison, September 2009. IRP developed the poverty estimates using the official Census definition of poverty.
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[43]U.S. Energy information Administration, "Residential Energy Consumption Survey, 2005."
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[45]American Council for Capital Formation and the National Association of Manufacturers, *Analysis of the Waxman-Markey Bill "The American Clean Energy and Security Act of 2009" (H.R. 2454)*, August 2009. This study uses the NEMS/ACCF-NAM 24 model. The ACCF-NAM analysis of the Waxman-Markey bill used the most recent version of the EIA *Annual Energy Outlook*, the April AEO 2009.
[46]The assumptions include the availability of nuclear power technology for electric generation, the availability of carbon capture and storage for more efficient coal and natural gas-based power generation technologies, and the availability of wind and biomass technologies. The ACCF-NAM input assumptions also included assumptions regarding the likely availability of domestic and international offsets -- key factors influencing analysis of the cost of limiting greenhouse gas emissions.
[47]To put these GDP losses in perspective, in 2008 the Federal government spent $612 billion on social security payments to retirees. Looked at another way, if GDP levels are reduced by $571 billion in 2030, Federal and State tax receipts will be approximately $170 billion lower that year, since federal and state governments take approximately 30 cents out of every dollar of GDP. Thus, government budgets will be harder to meet.

[48]National Black Chamber of Commerce, *Impact on the Economy of the American Clean Energy and Security Act of 2009 (H.R.2454)*, report prepared by CRA International, May 2009 (updated August 2009).
[49]All costs in this report are expressed in terms of 2008 dollars unless otherwise specified.
[50]In this report, when carbon or CO_2 allowance prices are discussed these prices are measured as dollars per metric ton of CO_2 equivalent (CO_2e).
[51]To the extent that utilities return the value of their free allocations under ACESA to customers through reductions in fixed charges, actual total bills for electricity and natural gas will not rise as much as the rates.
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[62]To put these numbers in perspective, the report noted the federal government spent $43 billion on the Department of Homeland Security in 2007, $155 billion on U.S. highways in 2005, and $549 billion on the Department of Defense in 2007.
[63]The American Council for Capital Formation and the National Association of Manufacturers, *Analysis of the Lieberman-Warner Climate Security Act (S. 2191) Using the National Energy Modeling System (NEMS/ACCF/NAM)*, report prepared by SAIC, March 2008.