POTENTIAL IMPACT OF THE EPA ENDANGERMENT FINDING ON LOW INCOME GROUPS AND MINORITIES

Prepared By:

Management Information Services, Inc.
Washington, D.C.
202-889-1324
www.misi-net.com

For:

Affordable Power Alliance
www.affordablepoweralliance.org

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EXECUTIVE SUMMARY

On December 7, 2009 the U.S. Environmental Protection Agency issued its long-anticipated “Endangerment Finding," which was a prerequisite to finalizing EPA's proposed greenhouse gas emission standards. Implementation of this Finding could affect millions of entities and lead to the most comprehensive, restrictive and intrusive environmental regulations in U.S. history. A major impact of this Finding would be restrictions on the availability and increases in the prices of fossil fuels, especially coal. The economic impacts of the Finding in terms of GDP, incomes, industrial activity, jobs and other indicators likely would be severe. Due to their economic vulnerability, low-income groups, African Americans, and Hispanics and senior citizens would be seriously and disproportionately impacted..

This report analyzes the likely economic, employment, and energy market impacts of the EPA Finding with special emphasis on the impacts on low-income groups, the elderly, African Americans, and Hispanics. No comprehensive analyses of the economic impacts of the EPA Finding have thus far been conducted, and here we used the results of various studies conducted in recent years on the impacts of different CO_2 restriction programs and proposed legislation.

Major Finding

Our major finding is that the CO_2 restrictions implied in the EPA regulation would have serious economic, employment, and energy market impacts at the national level (Figures EX-1 and EX-2) and for all states, and that the impacts on low-income groups, the elderly, African Americans, and Hispanics would be especially severe. We estimated that implementation of the EPA Finding would:

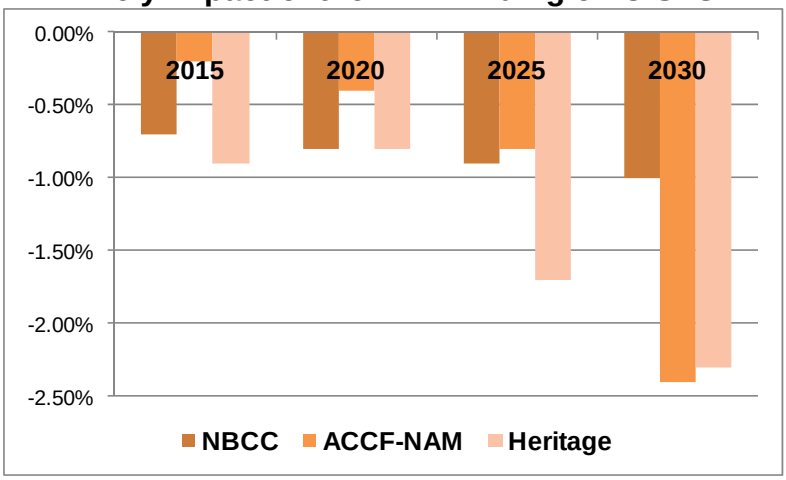
- Significantly reduce U.S. GDP every year over the next two decades, and by 2030 GDP would be about $500 billion less than in the reference case – which assumed no EPA carbon restrictions.
- Significantly reduce U.S. employment over the next two decades, and by 2030 would result in the loss of 2.5 million 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 carbon restrictions would greatly increase U.S. energy costs, and by 2030 these increases (above the reference case) could total:

- 50 percent for gasoline prices
- 50 percent for residential electricity prices
- 75 percent for industrial electricity prices
- 75 percent for residential natural gas prices
- 100 percent for industrial natural gas prices

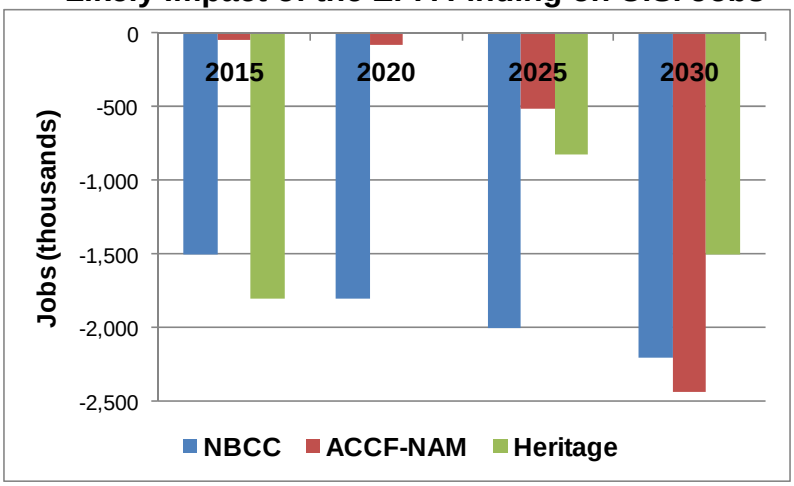
- 40 percent for jet fuel prices
- 40 percent for diesel prices
- 600 percent for electric utility coal prices

Figure EX-1
Likely Impact of the EPA Finding on U.S. GDP



Source: Management Information Services, Inc., 2010.

Figure EX-2
Likely Impact of the EPA Finding on U.S. Jobs



Source: Management Information Services, Inc., 2010.

The EPA regulation 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 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. This disparity between racial groups means that rising energy costs have a disproportionately negative effect on the ability of minority families to acquire other

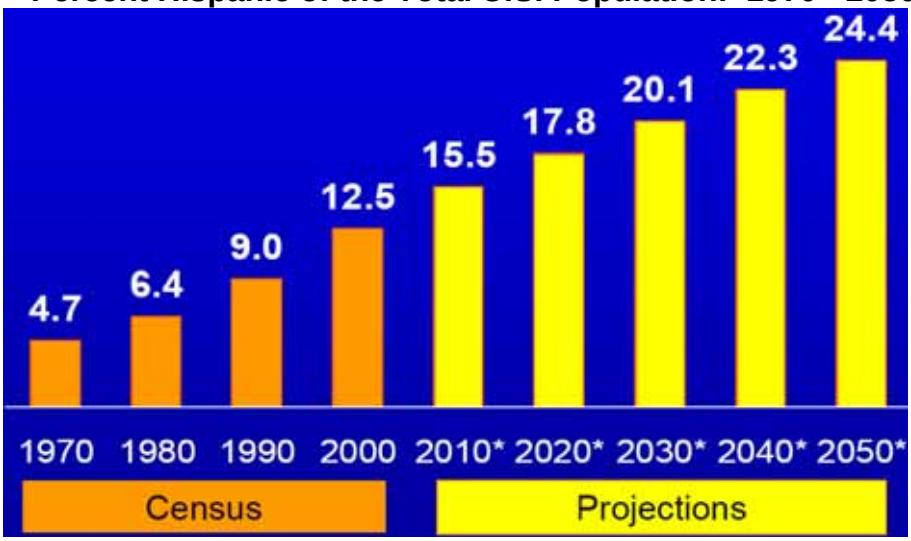
necessities such as food, housing, childcare, or healthcare. Essentially, the EPA Finding will have the effect of a discriminatory tax based on race.

Demographic Changes

Figure EX-3 indicates that the growth in the Hispanic population is the salient U.S. demographic development:

- In 1970, less than five percent of the U.S. population was Hispanic.
- In 2000, about 13 percent of the U.S. population was Hispanic.
- In 2030, about 20 percent of the U.S. population will be Hispanic.
- In 2050, about 25 percent of the U.S. population will be Hispanic.
- In recent years, about one of every two persons added to the U.S. population was Hispanic.

Figure EX-3
Percent Hispanic of the Total U.S. Population: 1970 - 2050



Source: U.S. Census Bureau, 2010.

Hispanics have displaced African Americans as the largest U.S. minority group, and their numerical dominance will continue to increase. The portion of the population that is non-Hispanic White declines from 80 percent in 1980 to about 50 percent in 2050. The portion of the U.S. that is Black will remain at about 13 percent over the next several decades.

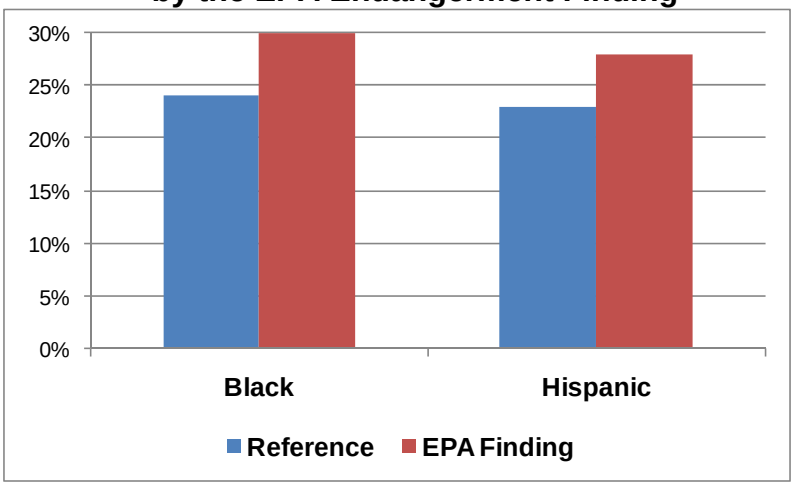
Impact on Poverty Rates

Black and Hispanic workers -- and their families – will likely be adversely affected threefold if the EPA Endangerment Finding is implemented: 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 much longer to find another job. These impacts on earnings and employment will increase the rates of

poverty among African Americans and Hispanics, and we estimate that one of the impacts of implementing the EPA Finding will be to, by 2025 (Figure EX-4):

- 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 African Americans from 24 percent to about 30 percent. This represents an increase in Black poverty of 20 percent.

Figure EX-4
Increases in 2025 Poverty Rates Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

This must be considered one of the more troubling potential impacts of the EPA Finding. An unintended result of the EPA regulation will likely be to force millions of African Americans and Hispanics below the poverty line -- many of whom have only recently managed to work their way out of poverty.

In addition, the EPA CO_2 restrictions, by increasing the costs of energy and energy-intensive building materials, will increase the costs of housing. This will seriously affect African Americans and Hispanics because they have higher housing costs and a lower rate of home ownership than Whites:

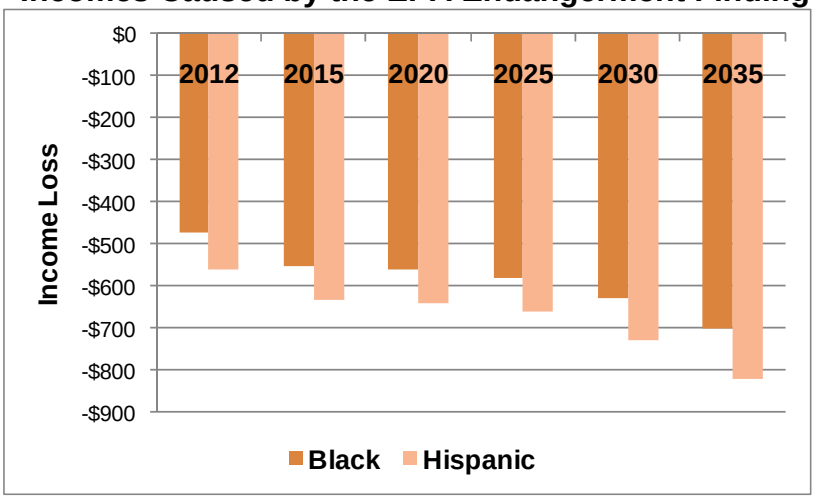
- Only about ten percent of Whites pay 50 percent or more of their income in housing costs; the comparable percentage for African Americans and Hispanics is about 20 percent.
- Whereas 25 percent of Whites pay 30 percent or more of their income in housing costs, the comparable percent for African Americans is 40 percent, and for Hispanics it is 45 percent.

Impact on Incomes

Consumers and households will ultimately bear the added costs that will result from the EPA Endangerment Finding, and implementation of the Finding will reduce Black and Hispanic household incomes by increasing amounts each year (Figure EX-5):

- In 2015, Black median household income will decrease about $550 compared to the reference case (which assumes that the EPA Finding is 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-5
Losses in Black and Hispanic Median Household Incomes Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

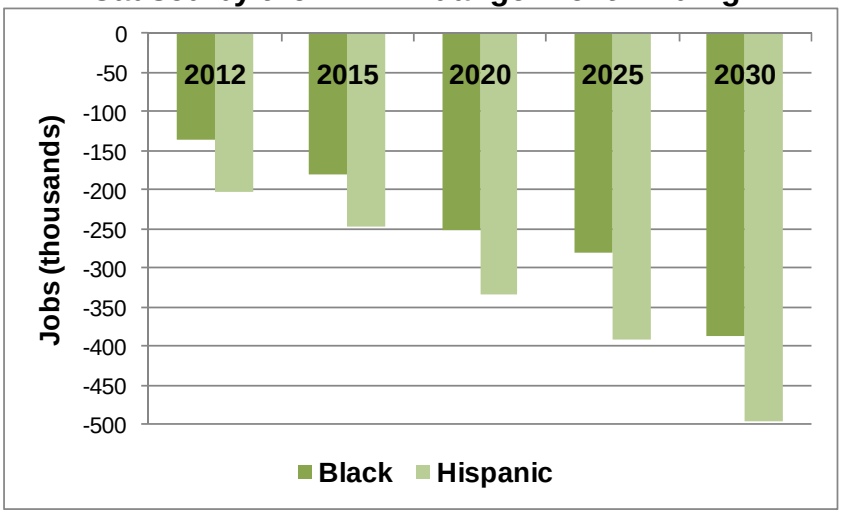
Impact on Jobs

The most salient characteristic of the employment status of African Americans and Hispanics is the fact that their unemployment rates have consistently been much higher than average and than those for Whites. African Americans 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 Finding would result in the loss of an increasingly large number of Black and Hispanic jobs (Figure EX-6):

- 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-6
Black and Hispanic Job Losses
Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

The job losses increase every year, and the cumulative losses for African Americans and Hispanics will grow rapidly over the next two decades if the EPA regulation is enacted:

- By 2020, cumulative job losses for African Americans will total nearly 1.7 million.
- By 2030, cumulative job losses for African Americans will total about 4.9 million.
- 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.

Impact on Basic Expenditures and Discretionary Income

African Americans 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 Finding

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 Finding will likely have a doubly negative impact on the living standards of African Americans and Hispanics:

- First, implementing the Finding will decrease Black and Hispanic incomes below where they would be in the absence of the regulation.
- Second, the Finding will increase the costs of the basic goods upon which African Americans and Hispanics must spend their reduced incomes.

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

- African Americans 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 Finding will exacerbate this situation by forcing African Americans 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 Finding 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 Finding will reduce the average discretionary incomes of both African Americans and Hispanics.

Increased Energy Poverty

One of the more serious, but less recognized effects of implementing the EPA Finding will be to significantly increase the energy burdens for the elderly, African Americans, and Hispanics and increase the numbers of African Americans and Hispanics 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

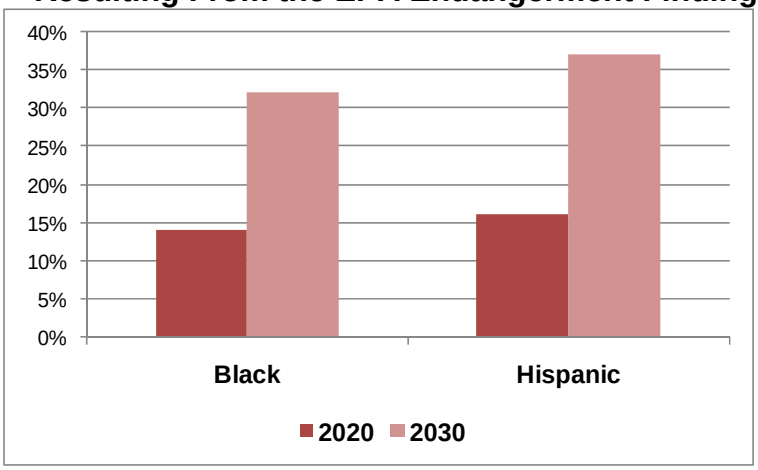
same time, the EPA regulation will threaten low-income access to vital energy and utility services, thereby endangering health and safety while creating additional barriers to meaningful low-income participation in the economy.

For the low-income elderly who are particularly susceptible to weather-related illness such as hypothermia, a high energy burden can represent a life-threatening challenge.[1] Implementation of the EPA Finding 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. The price increases resulting from carbon restrictions would be highly regressive -- they would place a relatively greater burden on lower-income households than on higher-income ones. In addition to health risks, 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 regulation would be to significantly increase the energy burdens for African Americans and Hispanics and to force large numbers of both groups into energy poverty. Implementing the EPA Finding would (Figure EX-7):

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

Figure EX-7
Increases in Black and Hispanic Energy Burdens Resulting From the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

[1]The energy burden is defined as the percentage of gross annual household income that is used to pay annual residential energy bills.

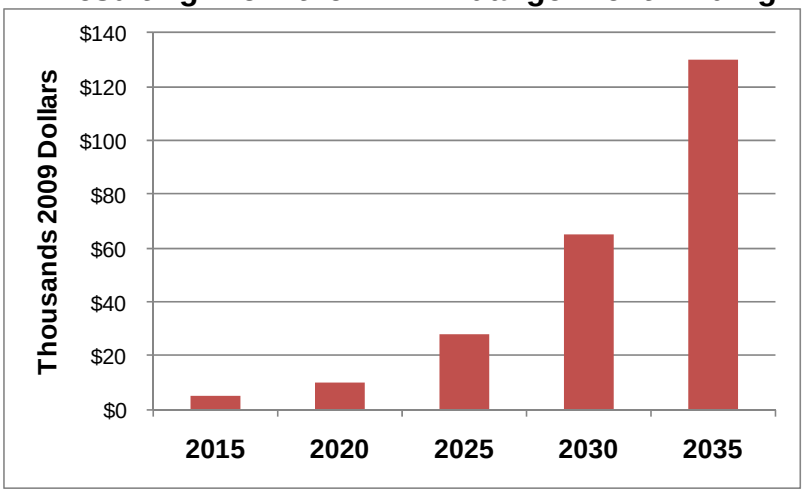
Impacts on Minority Small Businesses

Small businesses will face higher costs for energy and other products as a result of the EPA Finding, and the impact on Black and Hispanic small businesses will be especially severe. Black- and Hispanic-owned businesses represent a disproportionately small share of total businesses, tend to be smaller and less well capitalized than White-owned businesses, and are much more vulnerable to the economic dislocations likely to result from the EPA CO_2 restrictions. Thus, the potential impact of the EPA regulation on Black and Hispanic Businesses is significant.

Impacts on the Federal Debt Burden

As the economy adjusts to a reduced GDP the negative economic impacts accumulate, and the national debt will be affected. We estimate that the EPA regulation could increase the federal debt by nearly 30 percent by 2035 – over and above what it would be without the regulation (Figure EX-8). This represents an additional $33,000 per person, or more than $130,000 for a family of four. Since Black and Hispanic incomes are well below the U.S. average, the increased burden of this incremental debt would be 25 percent higher for Hispanic families and about 33 percent higher for Hispanic families.

Figure EX-8
Increased Federal Debt Burden For a Family of Four
Resulting From the EPA Endangerment Finding



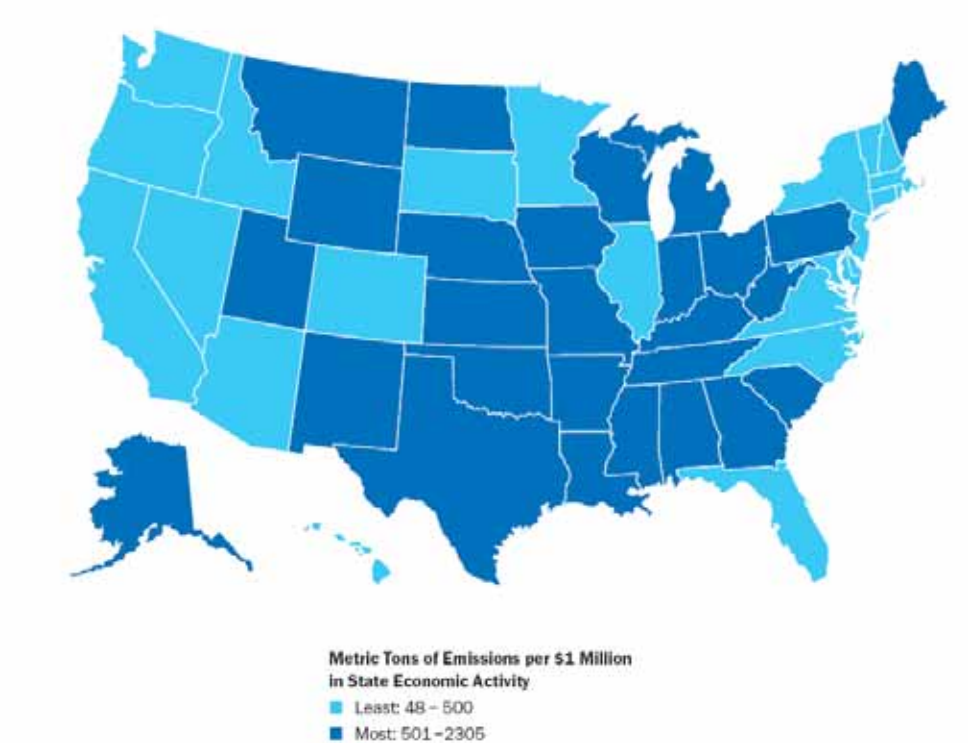
Source: Heritage Foundation and Management Information Services, Inc., 2010.

Impacts on African Americans and Hispanics by State

The impact of implementing the EPA Finding on the U.S. economy, and on low-income groups, African Americans, and Hispanics, will be severe. The regulation will cause higher energy costs to spread throughout the economy as producers try to cover their higher production costs by raising their product prices, and these impacts will be felt to varying degrees in different states. For example, because virtually all businesses rely on electricity to produce and sell goods and services, the economic impacts of coal-

based energy extend far beyond the generation and sale of electricity. The availability of low-cost electricity produces powerful ripple effects that benefit state economies as a whole, but implementation of the EPA regulation would greatly increase electricity prices – much more in some states than in others. For example, consumers in the Midwest and the Southeast will literally face double the impacts of carbon caps than consumers elsewhere in the country (Figure EX-9).

Figure EX-9
Relative CO_2 Emissions Per State



Source: U.S. Environmental Protection Agency, 2009.

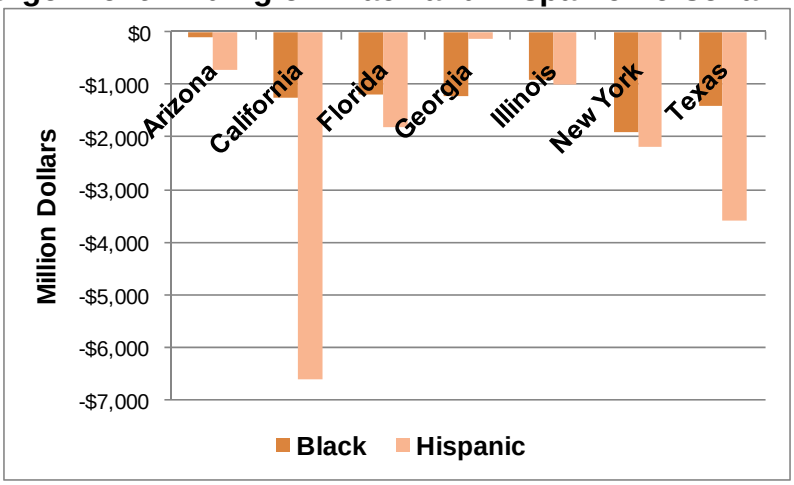
Since the proposed CO_2 restrictions would require continuing and increasingly severe reductions in the use of fossil energy to produce electricity in the states and cause large energy price increases, if the regulation is implemented all states will suffer substantial and increasingly severe economic and jobs impacts:

- Residents of all states will face increased costs for energy, utilities, and for other goods and services and will experience increased costs of living, beginning in 2012.
- Energy and electricity prices in each state would increase substantially, but to different degrees.
- The growth rates of state wages and incomes would be negatively affected over the next two decades, and by 2030 state per capita personal incomes would be significantly lower than in the absence of the EPA regulation.

- Millions of jobs would be lost in the states, employment would be lower, and unemployment higher.
- Industries and firms will relocate among states, thus causing a further loss of jobs in many states.
- New firms will hesitate to locate in some states, thus causing a reduction in the number of new jobs created.
- The combination of reduced economic activity in the states, decreased personal incomes for states' residents, and increased unemployment will strain state and local government budgets and result in reduced public services and increased taxes.

African Americans and Hispanics are disproportionately located in certain states, and their population concentration in these states will increase over time. We estimated the impacts of the EPA Finding on incomes in the seven states with the highest concentrations of African Americans and Hispanics: Arizona, California, Florida, Georgia, Illinois, New York, and Texas (Figure EX-10). In all states (except Georgia), the impacts on Hispanic incomes exceed the impacts on Black incomes, since there are more Hispanics than African Americans residing in these states. Further, the growth rates of the Hispanic population exceed those of African Americans in all of these states.

Figure EX-10
Average Annual Impact in Selected States, 2012-2035, of the EPA Endangerment Finding on Black and Hispanic Personal Incomes



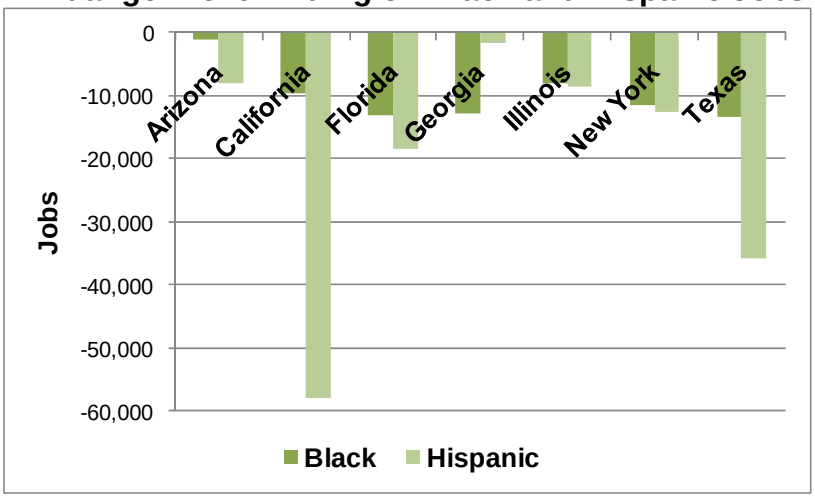
Source: Management Information Services, Inc., 2010.

The impacts vary widely among the states. The greatest loss of income will be experienced by Hispanics in California, since this state has, by far, the largest number of Hispanic residents and the most rapidly growing Hispanic population.

We estimated the average annual impacts in the seven states, 2012-2035, of the EPA Finding on Black and Hispanic jobs (Figure EX-11). In all states (except for

Georgia), Hispanic job losses exceed Black job losses, since there are more Hispanics than African Americans residing in these states.

Figure EX-11
Average Annual Impact in Selected States, 2012-2035, of the EPA Endangerment Finding on Black and Hispanic Jobs



Source: Management Information Services, Inc., 2010.

The greatest job losses will be experienced by Hispanics in California, since this state has, by far, the largest number of Hispanic residents. Nevertheless, the job losses are substantial in every state. For example, every year 2012 – 2035, average Hispanic job losses will total:

- Nearly 70,000 in California
- Nearly 40,000 in Texas
- Nearly 20,000 in Florida
- Nearly 13,000 in New York

Every year 2012 – 2035, average Black job losses will total:

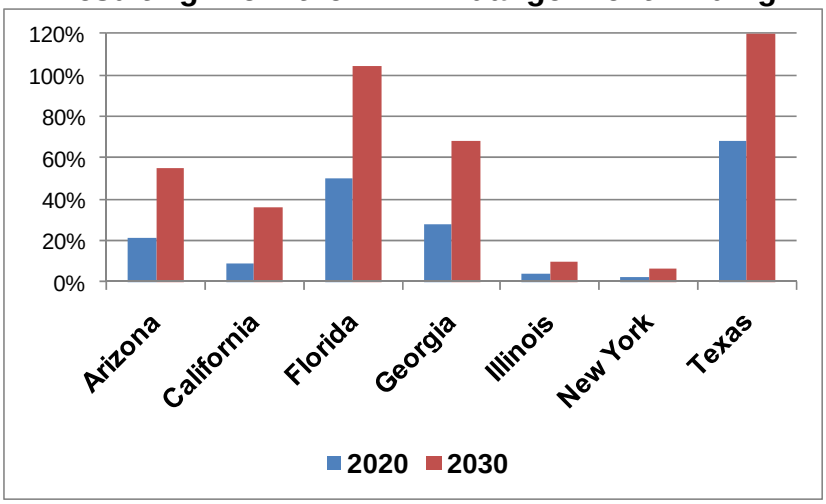
- More than 13,000 in Texas
- More than 13,000 in Florida
- Nearly 13,000 in Georgia
- Nearly 12,000 in New York

While Hispanic jobs losses exceed Black job losses in all of the states except Georgia, in some states job losses for the two groups are about the same – for example, in New York and in Illinois.

We estimated the increases in Hispanic and Black energy burdens in the states in 2020 and 2030 resulting from the EPA Endangerment Finding and found that (Figures EX-12 and EX-13):

- The energy burdens for both African Americans and Hispanics increase in each year.
- For each group, the increases in energy burdens in 2030 are much larger than those in 2020.
- For each group, the increases in energy burdens are the largest in Texas, Florida, Georgia, and Arizona.
- In some states, such as Florida, Georgia, and Texas, the increased energy burden is larger for African Americans than for Hispanics.
- In some other states, such as Arizona, California, and Illinois, the increased energy burden is larger for Hispanics than for African Americans.

Figure EX-12
Increase in Hispanic Energy Burdens in Selected States Resulting From the EPA Endangerment Finding

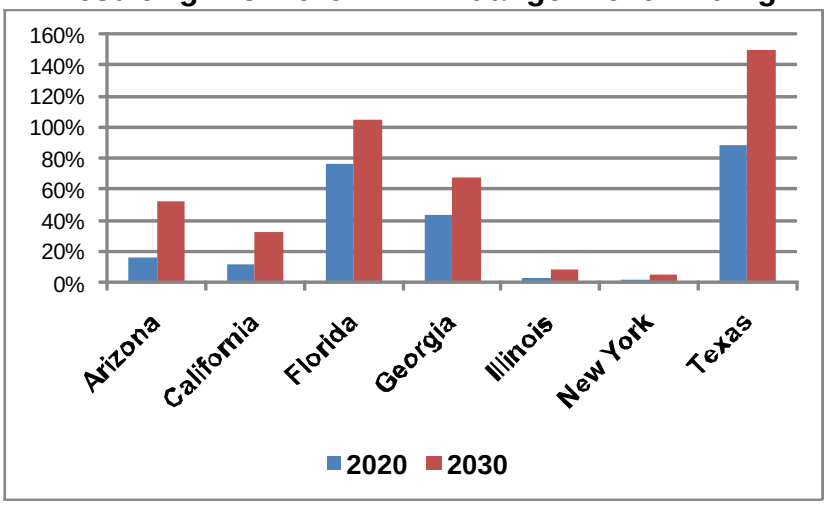


Source: Management Information Services, Inc., 2010.

Conservative Estimates

The results derived here should be viewed as conservative and as indicating the minimal negative effects that may be expected. The reason is that the CO_2 restriction programs and legislation that have been analyzed contain numerous subsidy, rebate, compensation, and incentive provisions to lessen the burden of the CO_2 restrictions – at least in the short run. The EPA Finding contains no such provisions, and EPA is not permitted to consider economic impacts in developing regulations. Thus, the impacts of the EPA Finding on the economy and labor market are likely to be even more severe than those estimated here.

Figure EX-13
Increase in Black Energy Burdens in Selected States Resulting From the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

I. INTRODUCTION

On December 7, 2009 the U.S. Environmental Protection Agency issued its long-anticipated “Endangerment Finding," which was a prerequisite to finalizing EPA's proposed greenhouse gas emission standards. Implementation of this Finding could affect millions of entities and lead to the most comprehensive, restrictive, and intrusive environmental regulations in U.S. history. A major impact of this Finding would be restrictions on the availability and increases in the prices of fossil fuels, especially coal. The economic impacts of the Finding 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, African Americans, and Hispanics would be disproportionate and especially serious.

Accordingly, this report analyzes the likely economic, employment, and energy market impacts of the EPA Finding with special emphasis on the impacts on low-income groups, the elderly, African Americans, and Hispanics. No comprehensive analyses of the economic impacts of the EPA Finding 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. The reason is that the CO_2 restriction programs and legislation that have been analyzed contain numerous subsidy, rebate, and incentive provisions to lessen the burden of the CO_2 restrictions – at least in the short run. The EPA Finding contains no such provisions, and EPA is not permitted to consider economic impacts in developing regulations. Thus, the impacts of the EPA Finding on the economy and labor market are likely to be even more severe than those estimated here.

The report is organized as follows:

- Chapter II discusses the EPA Endangerment Finding.
- Chapter III reviews recent studies of the economic impacts of CO_2 restrictions upon which the estimates derived here are based.
- Chapter IV discusses the impacts of CO_2 regulation on the national economy and jobs.
- Chapter V discusses state impacts.
- Chapter VI analyzes Black and Hispanic population and demographic trends at the national and state levels.
- Chapter VII analyzes the likely impacts of the EPA endangerment finding on low-income persons, African Americans, and Hispanics.
- Chapter VIII discusses the findings and implications derived here.

II. THE EPA CO_2 ENDANGERMENT FINDING

On December 7, 2009 the U.S. Environmental Protection Agency issued its long-anticipated "Endangerment Finding."[2] EPA Administrator Lisa P. Jackson stated that "This finding confirms that greenhouse gas pollution is a serious problem now and for future generations. In both magnitude and probability, climate change is an enormous problem. The greenhouse gases that are responsible for it endanger public health and welfare within the meaning of the Clean Air Act (CAA)."[3]

On December 7, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key greenhouse gases (GHGs) pose a potential threat: Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing EPA's proposed greenhouse gas emission standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportation's proposed corporate average fuel efficiency (CAFE) standards on September 15, 2009.[4]

EPA contends that climate change may lead to higher concentrations of ground-level ozone and that additional impacts of climate change include increased drought, more heavy downpours and flooding, more frequent and intense heat waves and wildfires, greater sea level rise, more intense storms, and harm to water resources, agriculture, wildlife, and ecosystems. The agency also stated that that climate change has serious national security implications. Further, EPA stated that climate change would have a disproportionate impact on the health of certain segments of the population, such as the poor, the very young, the elderly, those already in poor health, the disabled, those living alone and/or indigenous populations dependent on one or a few resources.

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[2] www.epa.gov/climatechange/endangerment.html.

[3] "Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act," Environmental Protection Agency press release, December 7, 2009.

[4] U.S. Environmental Protection Agency, "EPA and NHTSA Propose Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," EPA-420-F-09-047a, September 2009.

The Finding has entered the public comment period, which is the next step in the deliberative process EPA must undertake before issuing final findings. The Finding did not include any proposed regulations, and prior to taking any steps to reduce GHGs under the CAA EPA must conduct an appropriate process and consider stakeholder input.[5]

The Finding was long-anticipated because of an April 2007 Supreme Court ruling (Massachusetts v. EPA) which found that Congress authorized EPA to regulate GHGs for climate change purposes when it enacted the 1970 CAA. That decision all but ensured that EPA would issue an Endangerment Finding for GHGs which, in turn, would compel EPA under the CAA to establish first-ever GHG emission standards for new motor vehicles. The timeline for the Finding was:

- On April 2, 2007, in Massachusetts v. EPA, the Supreme Court found that GHGs are air pollutants covered by the CAA. The Court held that the Administrator must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the Administrator is required to follow the language of section 202(a) of the Clean Air Act. The Supreme Court decision resulted from a petition for rulemaking under section 202(a) filed by more than a dozen environmental, renewable energy, and other organizations.
- On April 17, 2009, the EPA Administrator signed proposed endangerment and cause or contribute findings for GHGs under Section 202(a) of the Clean Air Act. EPA held a 60-day public comment period, which ended June 23, 2009, and received over 380,000 public comments. These included both written comments as well as testimony at two public hearings in Arlington, Virginia and Seattle, Washington. EPA reviewed, considered, and incorporated public comments and then issued its final findings.
- The findings were signed by the Administrator on December 7, 2009.
- On December 15, 2009, the final findings were published in the *Federal Register*.
- The final rule was effective January 14, 2010.

However, there is a Catch 22 involved: Once EPA adopts the GHG motor vehicle standards, CO_2 automatically becomes a pollutant "subject to regulation" under the CAA Prevention of Significant Deterioration (PSD) pre-construction permitting program and the Title V operating permits program.[6] Under the CAA, firms must obtain a PSD permit in order to construct or modify a "major emitting facility," and a permit to

[5]"The EPA Endangerment Finding," *Energy Bulletin*, December 9, 2009.
[6]See Roger H. Bezdek, "Despite Legislative Successes, Increased Federal Regulation Threatens U.S. Oil and Gas," *World Oil*, February, 2010, pp. 41–44.

operate such a facility. A facility is major under PSD if it is in one of 28 categories and has a potential to emit 100 tons per year (TPY) of a regulated pollutant, or 250 TPY if it is any other type of establishment. Millions of currently unregulated buildings and facilities -- office buildings, apartment buildings, commercial and retail stores, shopping malls, heated agricultural facilities, small manufacturing firms, commercial kitchens, etc. -- emit enough CO_2 to meet these thresholds.

EPA estimates that if PSD were to be applied as written to CO_2 sources, the number of PSD permit applications per year would increase from 300 to more than 41,000, and the number of Title V permit applications would increase from 15,000 to 6.1 million. This is clearly neither technically nor politically feasible, and EPA has proposed a Tailoring Rule to limit the number of permits required by suspending the PSD and Title V requirements for any source emitting less than 25,000 TPY of CO_2-equivalent GHGs.

However, it is unclear whether EPA's Tailoring Rule will survive judicial challenge because it conflicts with statutory language. Further, to show that EPA is not amending the CAA, the Agency contends in the Tailoring Rule that its goal is to apply PSD and Title V to smaller and smaller CO_2 sources over time, eventually including sources emitting 250 TPY and 100 TPY. EPA proposes to spend five years developing "streamlined" permitting procedures for smaller sources, but the legality of such a plan is questionable.

Further, the Tailoring Rule itself is subject to legal uncertainty because of the clarity in which the CAA specifies the 250-ton threshold, seeming to leave little room for the EPA to raise the threshold to 25,000 tons arbitrarily.[7] While that issue appears likely to play out in court, many smaller emitters are faced with considerable uncertainty as to whether they will actually be temporarily protected under the tailoring rule. If not, as noted, EPA estimates that more than 6 million new sources could be subject to regulation, including 1.4 million commercial buildings, and at least one million mid-sized to large commercial buildings emit enough CO_2 per year to become EPA regulated stationary sources.[8] For example, the threshold would be reached by one-fifth of all food services, one-third of those in health care, half of those in the lodging industry, even 10 percent of buildings used for religious worship.[9]

Most important, the Tailoring Rule, if upheld by courts, could result in the imposition of national ambient air quality standards (NAAQS) for CO_2 that could seriously harm the U.S. economy.[10] The endangerment finding asserts that current atmospheric CO_2 concentrations endanger public health and welfare, and a NAAQS for CO_2 would thus have to be set below current levels. Environmental organizations have already petitioned EPA to establish NAAQS for CO_2 set at 350 parts per million (PPM).

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[7]U.S. Environmental Protection Agency, "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule," October, 27, 2009.
[8]Ibid.
[9]M. Portia, E. Mills, and Mark P. Mills, "A Regulatory Burden: The Compliance Dimension of Regulating CO_2 as a Pollutant," U.S. Chamber of Commerce, September 2008.
[10]Ben Lieberman, "Small Business Impact of the EPA Endangerment Finding," Heritage Foundation, January 20, 2010.

The present atmospheric CO_2 level is about 390 PPM. Even if the entire world et the emissions reduction target of the Waxman-Markey bill -- 83% below 2005 levels by 2050 -- this would only "stabilize" CO_2 concentrations at about 450 PPM. Not even a worldwide depression lasting decades would be sufficient to reduce CO_2 concentrations to 350 PPM. Nevertheless, under established legal interpretation, EPA is prohibited from considering compliance costs when establishing NAAQS. Thus, according to EPA, the endangerment test cannot legally weigh the economic impacts of the GHG regulations that will be promulgated pursuant to this finding.[11]

Industry groups have also initiated legal challenges, and their prospects may be favorable. EPA derives its authority to regulate pollutants from the CAA, but to use that law to regulate GHGs the agency must prove those gases are harmful to human health. That is, it must prove that a slightly warmer climate will cause Americans injury or death. Given that many climate scientists contend that a warmer earth could provide net benefits to the U.S., this may be difficult. Further, the leaked emails from the Climatic Research Unit in England ("Climategate") are providing rich fodder for those who want to challenge the science underlying the theory of manmade global warming.

Nevertheless, while Congress continues to debate the merits of climate change legislation and legal challenges to the Finding are filed, EPA has been steadily moving forward with a process to regulate GHGs under the framework of the CAA. As noted, on January 14, the first major step of that process -- a final rule concluding that GHGs endanger public health and welfare -- took effect, and with it the obligation to move forward with what could become the most expensive and intrusive set of regulations in U.S. history. The implementation of these rules will have a significant impact on the economy and all segments of the population, even if the "Tailoring Rule" survives legal challenges.

[11] "EPA Finalizes Endangerment Finding for Greenhouse Gases," Van Ness Feldman Law Firm, Washington, D.C., December 9, 2009.

III. 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. The more significant of these are summarized below in three 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, recent studies of the Impact of other climate change legislation, and EIA analyses of specific climate change legislation.

III.A. 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, which is designed to substantially reduce U.S. GHGs over the 2012-2050 period.[12] The ACCF and NAM believe it important to fully and realistically examine the potential costs that enactment of the Waxman-Markey bill would impose on the U.S. economy.

ACCF and 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.[13]

As summarized in Table III-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.

[12]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.

[13]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.

Table III-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$)				(118)	(339)	(730)	(250)	(564)	(1,248)
% Change				-0.1%	-0.3%	-0.6%	-0.3%	-0.5%	-1.0%
Energy Expenditures (Billion 2007$)	$ 1,490	$ 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	$ 4.96
% 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.[14] 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

[14]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.

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.[15] 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 III-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,

[15]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).

regions, and income groups, as do decisions about how to spend or return to taxpayers the revenues from allowance auctions.

Table III-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.

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.

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:[16]

- 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.[17] 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.[18]
- 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

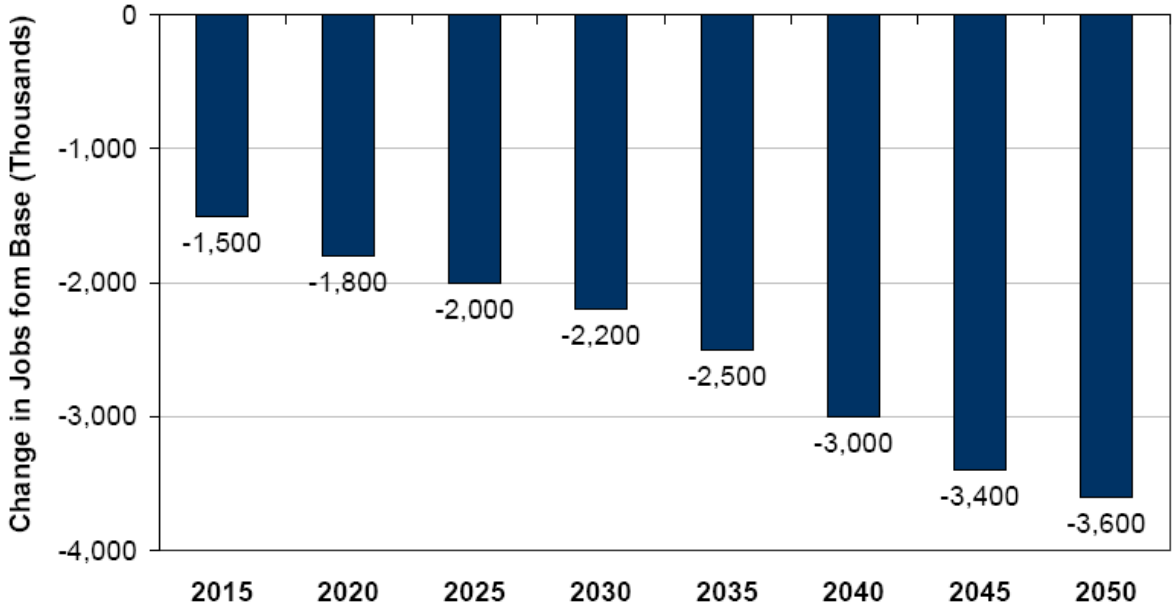
[16] All costs in this report are expressed in terms of 2008 dollars unless otherwise specified.
[17] In this report, when carbon or CO_2 allowance prices are discussed these prices are measured as dollars per metric ton of CO_2 equivalent (CO_2e).
[18] To the extent that utilities return the value of 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.

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 III-1 illustrates the employment impacts ASCEA.

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



Source: National Black Chamber of Commerce, 2009.

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 III-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. Because these estimated employment impacts are based on the general equilibrium requirement that total payments to labor must fall to the new, lower level that can be supported by the reduced overall productivity of the entire economy, they are inclusive of all increases in "green jobs" that will be created by ASCEA.

Heritage Foundation, 2009

An August 2009 Heritage Foundation study found that ASCEA would burden families with thousands of dollars per year in direct and indirect energy costs, and estimated these by state.[19] This study is discussed in Chapter V.

A May 2009 Heritage Foundation estimated the economic, energy, and job impacts of ASCEA at the national level.[20] This study forecast that by 2035 the bill will:

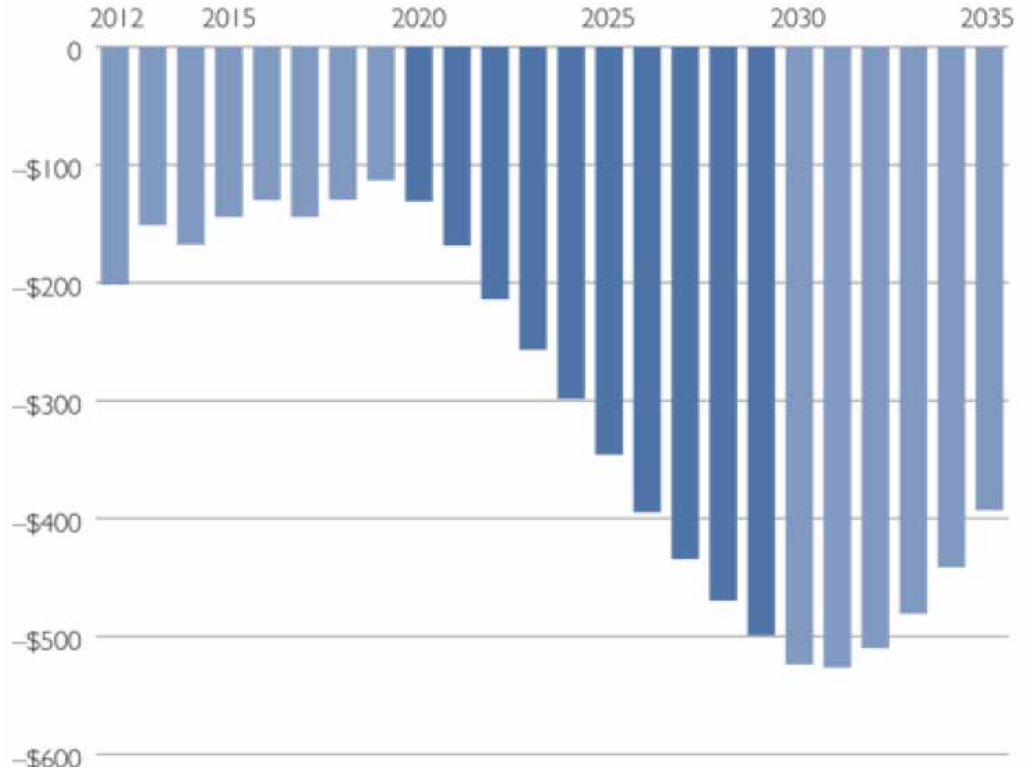
- Reduce aggregate gross domestic product (GDP) by $7.4 trillion (Figure III-2)
- Destroy 844,000 jobs on average, with peak years seeing unemployment rise by over 1,900,000 jobs
- Raise electricity rates 90 percent after adjusting for inflation
- Raise inflation-adjusted gasoline prices by 74 percent
- 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.

[19]David Kreutzer, Karen Campbell, William W. Beach, Ben Lieberman, and Nicolas Loris, *Impact of the Waxman–Markey Climate Change Legislation on the States*, Heritage Foundation, August 2009.
[20]William W. Beach, David Kreutzer, Karen Campbell, and Ben, Lieberman, *The Economic Impact of Waxman–Markey*, Heritage Foundation, May 2009.

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 III-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.[21] 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.[22] EPA's major findings included:

- H.R. 2454 transforms energy production and consumption: Increased energy efficiency and reduced energy demand mean that

[21]U.S. Environmental Protection Agency, Office of Atmospheric Programs, *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111th Congress*, June 23, 2009.
[22]Several provisions outside of the cap and trade program were not modeled in this analysis (e.g. lighting standards are not in the analysis, and the renewable electricity standard is not included in economy-wide modeling but is modeled as a sensitivity in power sector analysis).

energy consumption levels that would be reached in 2015 without the policy are not reached until 2040 with the policy.

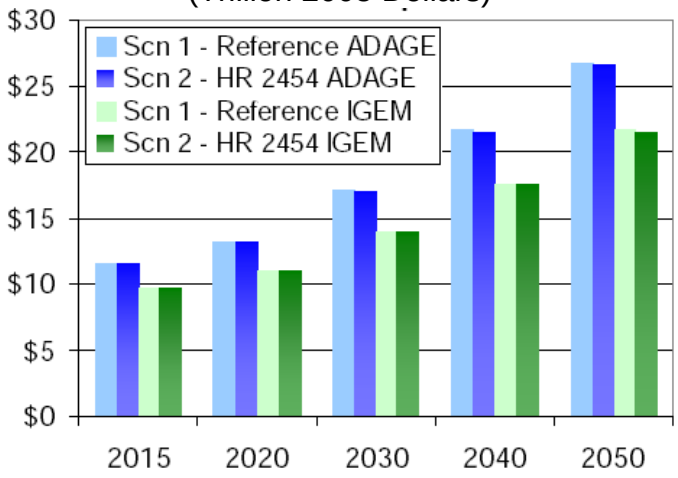
- The share of low- or zero-carbon primary energy (nuclear, renewables, and CCS) rises substantially under the policy to 18 percent of primary energy by 2020, 26 percent by 2030, and 38 percent by 2050, whereas without the policy the share would remain steady at 14 percent. Increased energy efficiency 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.[23]
- 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 points 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, but do not account for the benefits of avoiding the effects of climate change.

[23]Annual net present value cost per household (at a discount rate of 5 percent) averaged over 2010-2050 under the core scenario.

- 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 III-3.

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



Source: U.S. Environmental Protection Agency, 2009

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.[24] 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.[25]

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,

[24]U.S. Congressional Budget Office, *The Estimated Costs to Households From the Cap-and-Trade Provisions of H.R. 2454*, June 19, 2009.
[25]The analysis did not include the effects of other aspects of the bill, such as federal efforts to speed the development of new technologies and to increase energy efficiency by specifying standards or subsidizing energy-saving investments.

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.

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 the additional transfers and costs discussed above (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 III-3. Four factors account for that net cost:

- The purchase of international offset credits ($8 billion)
- The cost of producing domestic offset credits ($3 billion)
- The resource costs associated with reducing emissions ($5 billion)
- 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. Overall, costs for households would average 0.2 percent of their average after-tax income.

Table III-3
Total Cost and Average 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.[26] 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.

[26]The Brookings Institution, *Consequences of Cap and Trade*, June 2009.

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:

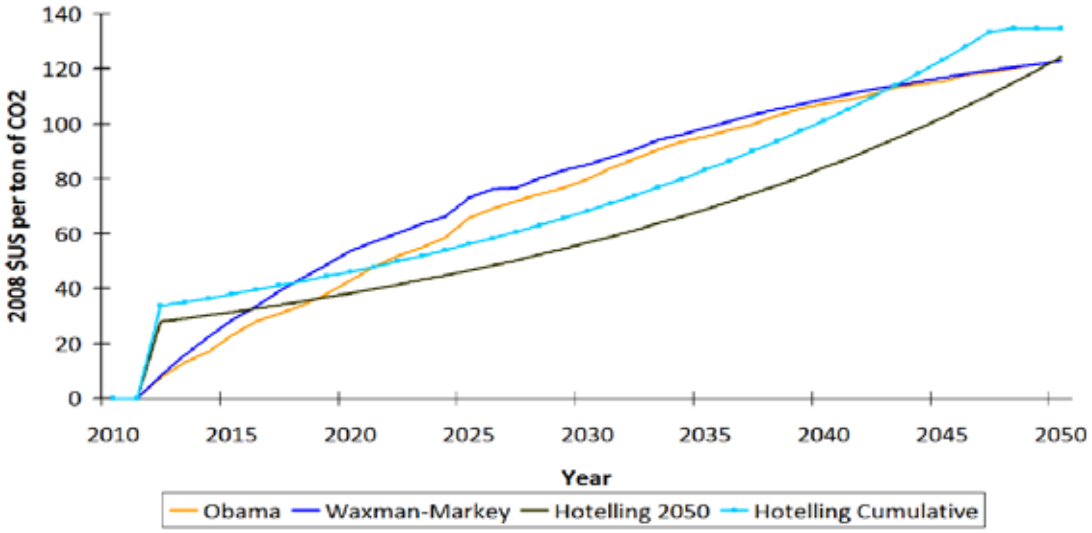
- Obama – GHG emissions 14 percent lower by 2020
- Waxman Markey -- GHG emissions 20 percent lower by 2020 and 40 percent lower by 2030
- Hotelling 2050 -- Least cost path to 83 percent reduction by 2050
- Hotelling Cumulative -- least cost path with the same cumulative emissions as Obama

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

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

Figure III-4

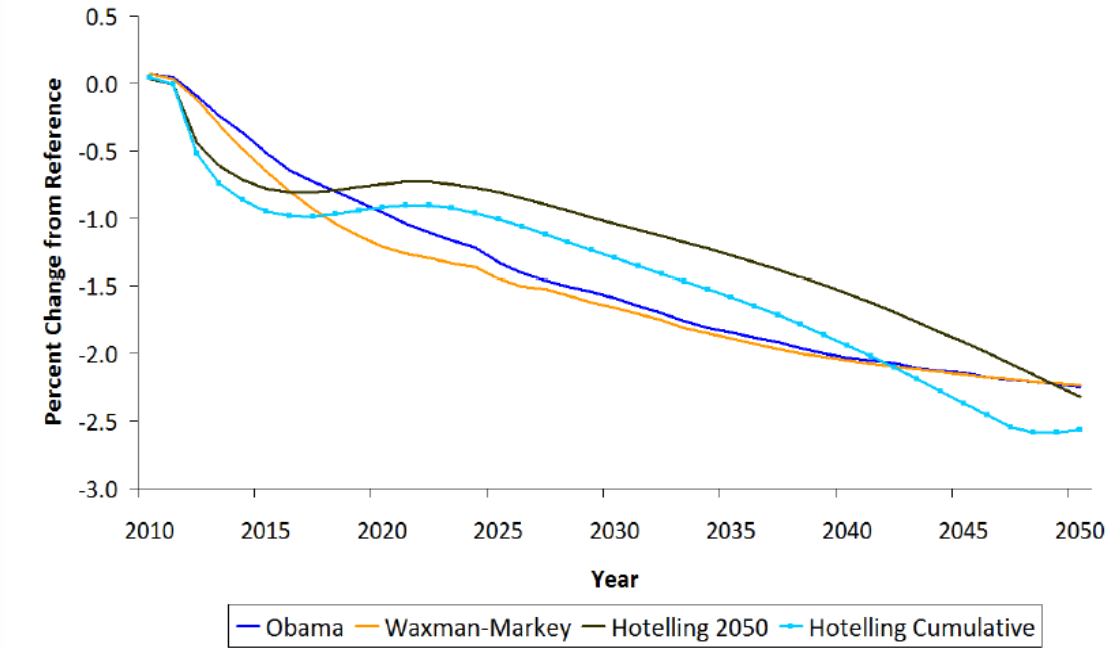
Carbon Prices Under Alternative Policies



Source: The Brookings Institution, 2009

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

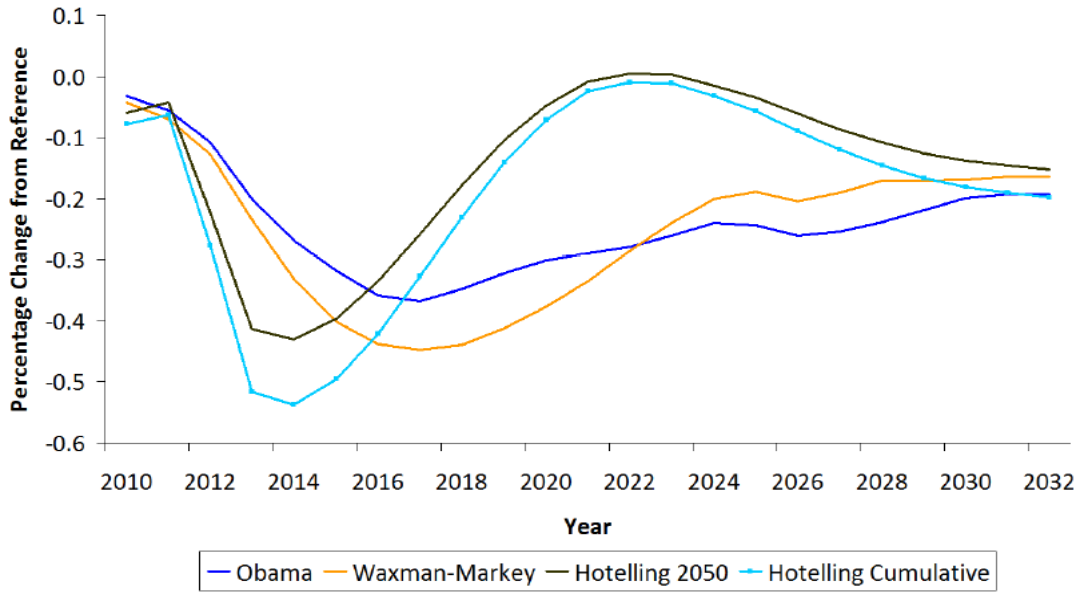
Figure III-5
Effect of Alternative Policies on US GDP



Source: The Brookings Institution, 2009

Total employment would be reduced – Figure III-6.

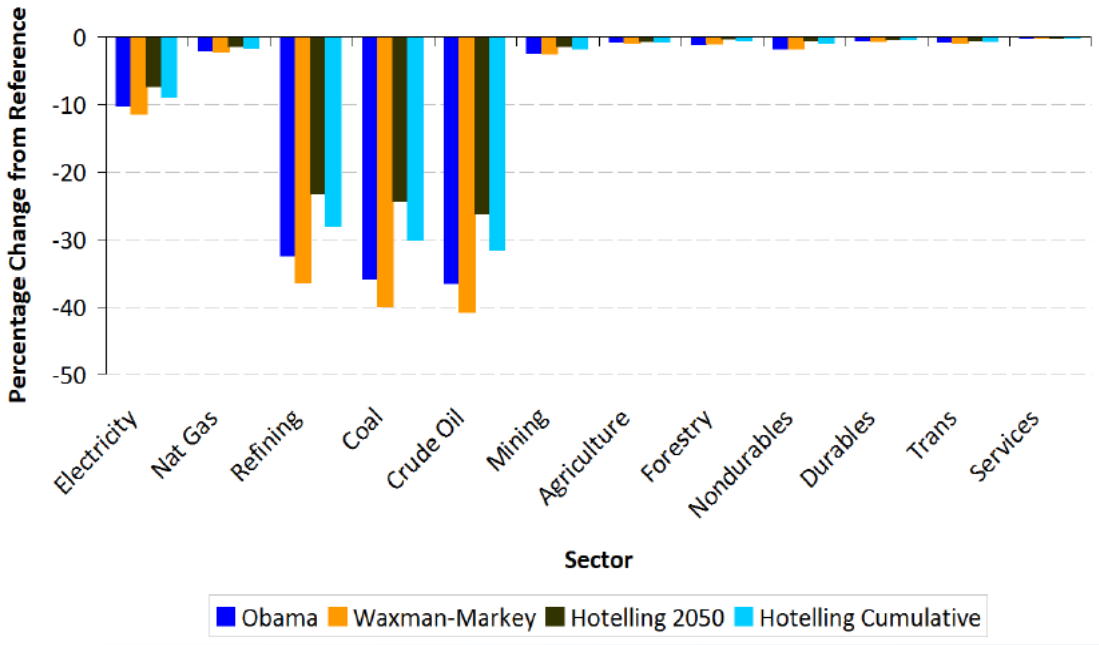
Figure III-6
Effect of Alternative Policies on US Employment



Source: The Brookings Institution, 2009

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

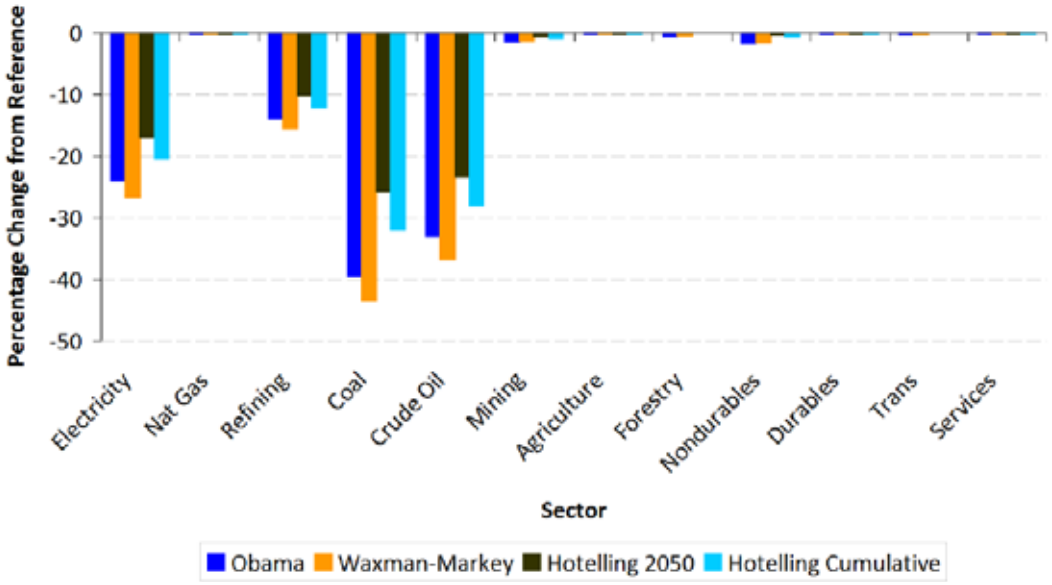
Figure III-7
Effect on Production in 2025



Source: The Brookings Institution, 2009

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

Figure III-8
Effect on Employment in 2025



Source: The Brookings Institution, 2009

III.B. 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.[27] 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 III-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

[27] Coalition for Affordable American Energy, *Impact on the Economy of the Climate Provision in the Obama Administration's FY 2010 Budget*, report prepared by CRA International, April 2009.

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.

Table III-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.

- 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.-located refineries to cover facility GHG emissions would not be faced by refineries located 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.

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 III-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).[28] 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 the periodic 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).[29]
- 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).[30]
- 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

[28]Heritage Foundation, *The Economic Costs of the Lieberman-Warner Climate Change Legislation*, Heritage Foundation Center for Data Analysis Report #08-02, May 2008.

[29]The analysis did not extend beyond 2030, at which point S. 2191 mandates GHG reductions to 33 percent below the 2005 level. However, it should be noted that the mandated GHG reductions continue to become more severe and must be 70 per-cent below the 2005 level by 2050.

[30]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.

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 CO2-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 following the boomlet of the first few years 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 after the boomlet 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.[31] 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/mtCO_2 in 2020, rising to between \$227 to \$271/mtCO_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).

[31]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.

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.

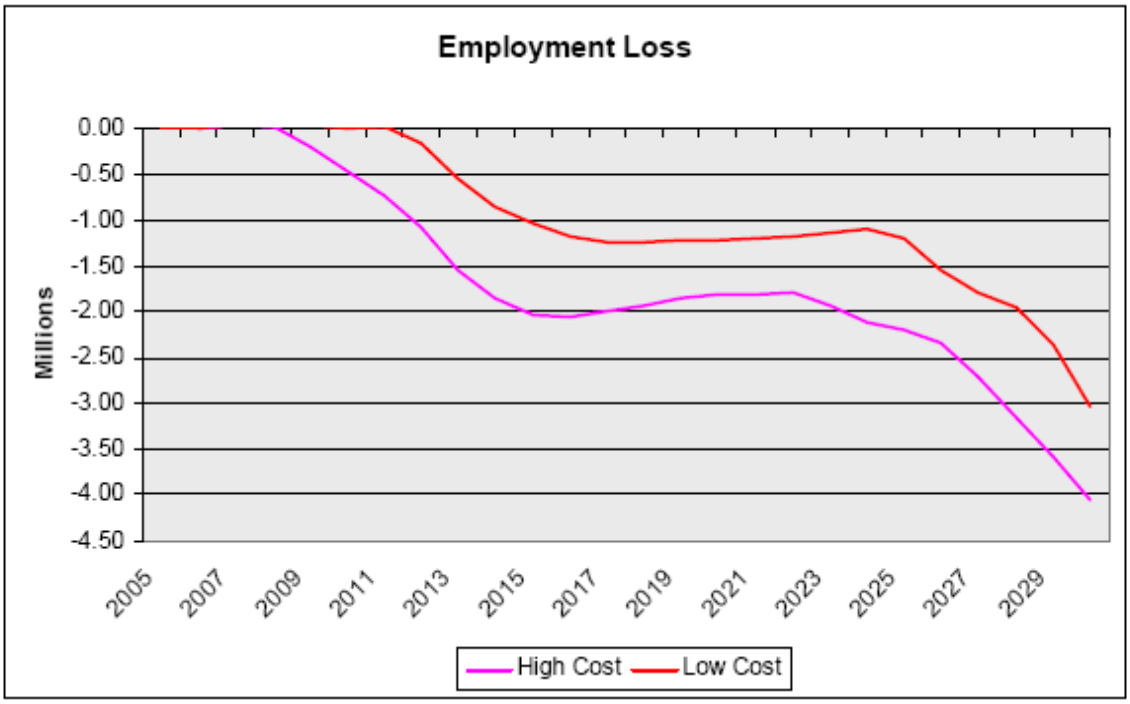
The ACCF/NAM analysis investigated the sensitivity of assumptions that have proven in the past to significantly impact the cost of limiting CO_2 emissions from energy – particularly the availability of improved technology in the early decades of a long-term effort to reduce GHGs. These assumptions include the availability of nuclear power technology, the availability of CCS for coal and natural gas-based power generation technologies, the availability of wind and biomass technologies, and the availability of low-cost offsets (international and domestic).

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 III-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.

III.C. U.S. Energy Information Administration Reports

EIA has conducted numerous studies of the impact of climate change legislation. Several of the more notable of these are summarized below.

Figure III-8
Estimated Job Losses from Lieberman-Warner



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

EIA, August 2009

This report examined the energy-related provisions in ACESA that can be analyzed using EIA's National Energy Modeling System (NEMS).[32] The Reference Case used as the starting point for the analysis was an updated version of the *Annual Energy Outlook 2009* (*AEO2009*) Reference Case issued in April 2009. Key provisions of ACESA analyzed include:[33]

- The GHG cap-and-trade program for gases other than HFCs,
- The combined efficiency and renewable electricity standard
- The CCS demonstration and early deployment program
- Federal building code updates
- Federal efficiency standards for lighting and other appliances
- Technology improvements
- The smart grid peak savings program

[32]U.S. Energy Information Administration, *Energy Market and Economic Impacts of H.R. 2454, the American Clean Energy and Security Act of 2009*, SR/OIAF/2009-05 August 2009.
[33]EIA did not address all the provisions of ACESA, and its analysis did not account for any possible health or environmental benefits that might be associated with curtailing GHG emissions.

While the emissions caps decline through 2050, the modeling horizon in this report runs only through 2030, the projection limit of NEMS.[34] EIA prepared a range of analysis cases, and the six main analysis cases focused on two key areas of uncertainty that impact the analysis results. First, the role of offsets is a large area of uncertainty in any analysis of ACESA. The 2-BMT annual limit on total offsets in ACESA is equivalent to 1/3 of total energy-related 2008 GHG emissions and represents nearly six times the projected growth in energy-related emissions through 2030.

The other major area of uncertainty involves the timing, cost, and public acceptance of low- and no-carbon technologies. For the period prior to 2030, the availability and cost of low- and no-carbon baseload electricity technologies, such as nuclear power and fossil with CCS, which can potentially displace a large amount of conventional coal-fired generation, is a key issue. However, technology availability over an extended horizon is a two-sided issue. R&D breakthroughs over the next two decades could expand the set of reasonably priced and scalable low- and no-carbon energy technologies, with opportunities for widespread deployment beyond 2030. The achievement of significant near-term progress towards such an outcome, however, could significantly reduce the size of the bank of allowances that covered entities and other market participants would want to carry forward to meet compliance requirements beyond 2030.

The main analysis cases discussed in this report are as follows:[35]

- The ACESA Basic Case assumed that key low-emissions technologies, including nuclear, fossil with CCS, and renewables, are deployed in a timeframe consistent with the emissions reduction requirements and that use of offsets is not constrained.
- The ACESA Zero Bank Case is similar to the Basic Case except that no banked allowances are held in 2030.
- The ACESA High Offsets Case is similar to the Basic Case except that it assumed the near immediate use of international offsets.
- The ACESA High Cost Case is similar to the Basic Case except that the costs of nuclear, coal with CCS, and biomass are assumed to be 50 percent higher.
- The ACESA No International Case is similar to the Basic Case, but assumed that the use of international offsets is severely limited.
- The ACESA No International/Limited Case combined the treatment of offsets in the ACESA No International Case with an assumption that deployment of key technologies cannot expand beyond their Reference Case levels through 2030.

[34] As in EIA analyses of earlier cap-and-trade proposals, the need to pursue higher-cost emissions reductions beyond 2030, driven by tighter caps and continued economic and population growth, can be analyzed by assuming that a positive bank of allowances is held at the end of 2030 in all but one case.

[35] EIA also discussed a number of additional analysis cases, including an enhanced CAFE standards case, a 5-percent discount case, a case with limitations to the penetration of nuclear, CCS, and biomass gasification, an accelerated energy technology case, and a higher level of allowance banking case.

EIA found that the reduction in covered emissions is exceeded by the amount of compliance generated through offsets in most of the main analysis cases. Cumulative compliance between 2012 and 2030 ranges from 24.4 BMT to 37.6 BMT CO_2-equivalent emissions in the main analysis cases, representing a 21 - 33 percent reduction from the cumulative covered emissions projected in the Reference Case.

Most reductions in energy-related emissions are expected to occur in the electric power sector. Across the ACESA main cases, the electricity sector accounts for between 80 and 88 percent of the total reduction in energy-related CO_2 emissions in 2030. Reductions in electricity-sector emissions are primarily achieved by reducing conventional coal-fired generation and increasing the use of no- or low-carbon generation technologies. In addition, a portion of the electricity-related CO_2 emissions reductions results from reduced electricity demand. If new nuclear, renewable, and fossil plants with CCS are not deployed in a timeframe consistent with emissions reduction requirements under ACESA, covered entities respond by increasing their use of offsets and by increasing natural gas use to offset reductions in coal generation.

Emissions reductions from changes in fossil fuel use in the residential, commercial, industrial, and transportation sectors are small relative to those in the electric power sector. Taken together, changes in fossil fuel use in these sectors account for between 12 percent and 20 percent of the total reduction in energy-related CO_2 emissions relative to the Reference Case in 2030.

GHG allowance prices are sensitive to the cost and availability of emissions offsets and low-and no-carbon generating technologies. Allowance prices in the ACESA Basic Case are projected at $32/mt in 2020 and $65/mt in 2030. Across all main analysis cases, allowance prices range from $20/mt to $93/mt in 2020 and from $41/mt to $191/mt (2007 dollars) in 2030.

ACESA increases energy prices, but effects on electricity and natural gas bills are mitigated through 2025 by the allocation of free allowances to utilities. Electricity prices in five of the six main ACESA cases range from 9.5¢/kWh to 9.6¢/kWh in 2020, only 3 to 4 percent above the Reference Case level. Average impacts on electricity prices in 2030 are projected to be substantially greater and in 2030 range from 10.7¢/kWh to 17.8 ¢/kWh. ACESA thus increases the cost of using energy, which reduces real economic output and purchasing power, and lowers aggregate demand. The result is that projected real GDP generally falls relative to the Reference Case. Total discounted GDP losses over the 2012 to 2030 time period are $566 billion (-0.3 percent) in the ACESA Basic Case, with a range from $432 billion (-0.2 percent) to $1,897 billion (-0.9 percent) across the main ACESA cases (Table III-5).

Consumption and energy bill impacts can also be expressed on a per household basis. In 2020, the reduction in household consumption is $134 (2007 dollars) in the ACESA Basic Case, with a range of $30 to $362 across all main ACESA cases. In 2030, household consumption is reduced by $339 in the ACESA Basic Case, with a range of $157 to $850 across all main ACESA cases.

Table III-5
Macroeconomic Impacts of ACESA Cases Relative to the Reference Case
(billion 2000 dollars, except where noted)

	Basic	Zero Bank	High Offsets	High Cost	No International	No Int / Limited
Cumulative Real Impacts 2012-2030 (present value using 4-percent discount rate)						
GDP						
Change	-566	-432	-523	-781	-717	-1897
Percent Change	-0.3%	-0.2%	-0.2%	-0.4%	-0.3%	-0.9%
Consumption						
Change	-273	-196	-252	-384	-323	-988
Percent Change	-0.2%	-0.1%	-0.2%	-0.3%	-0.2%	-0.7%
Industrial Shipments (excludes services)						
Change	-910	-753	-480	-958	-1720	-2877
Percent Change	-1.0%	-0.8%	-0.5%	-1.1%	-1.9%	-3.2%
Nominal Revenue Collected 2012-2030[a]	2971	1292	1332	2299	3462	6350
2020 Impacts (not discounted)						
GDP						
Change	-50	-19	-26	-70	-34	-112
Percent Change	-0.3%	-0.1%	-0.2%	-0.5%	-0.2%	-0.7%
Consumption						
Change	-21	-7	-11	-30	-15	-64
Percent Change	-0.2%	-0.1%	-0.1%	-0.3%	-0.1%	-0.6%
Industrial Shipments (excludes services)						
Change	-68	-54	-32	-69	-108	-186
Percent Change	-1.0%	-0.8%	-0.5%	-1.0%	-1.6%	-2.8%
Nominal Revenue Collected[a]	71	44	46	79	118	215
2030 Impacts (not discounted)						
GDP						
Change	-161	-104	-120	-214	-226	-453
Percent Change	-0.8%	-0.5%	-0.6%	-1.1%	-1.1%	-2.3%
Consumption						
Change	-63	-36	-50	-97	-69	-180
Percent Change	-0.4%	-0.3%	-0.4%	-0.7%	-0.5%	-1.3%
Industrial Shipments (excludes services)						
Change	-183	-125	-87	-198	-338	-506
Percent Change	-2.5%	-1.7%	-1.2%	-2.7%	-4.6%	-6.8%
Nominal Revenue Collected[a]	330	205	211	367	556	1030

Source: U.S. Energy Information Administration, 2009.

EIA, April 2008

This report was a response to a request from Senators Lieberman and Warner for an analysis of S. 2191, the Lieberman-Warner Climate Security Act of 2007, a complex bill regulating emissions GHGs through market-based mechanisms, energy efficiency programs, and economic incentives.[36] To analyze the provisions of S. 2191, several alternative cases were prepared:

[36]U.S. Energy Information Administration, *Energy Market and Economic Impacts of S. 2191, the Lieberman-Warner Climate Security Act of 2007*, SR/OIAF/2008-01, April 2008.

- The S. 2191 Core Case assumed that key low-emissions technologies, including nuclear, fossil with CCS, and various renewables, are deployed in a timeframe consistent with the emissions reduction requirements.
- The S. 2191 No International Offsets Case, is similar to the S. 2191 Core Case, but assumed that use of international offsets is limited.
- The S. 2191 High Cost Case is similar to the S.2191 Core Case except that the costs of nuclear, coal with CCS, and biomass are assumed to be 50 percent higher than in the Core Case.
- The S. 2191 Limited Alternatives Case assumes the deployment of key technologies, including nuclear, fossil with CCS, and various renewables, is held to their Reference Case level through 2030, as are imports of LNG.

EIA's key findings included the following:

- S. 2191 significantly reduces projected GHG emissions compared to the Reference Case. Projected covered emissions in the S. 2191 cases, net of offsets, are 27 percent to 36 percent lower in 2020 and 45 percent to 56 percent lower in 2030.
- The electric power sector accounts for most of the emissions reductions, with new nuclear, renewable, and fossil plants with CCS serving as the key compliance technologies. Electric power accounts for 82 - 87 percent of energy-related CO_2 emissions reductions in 2020 and 82 - 92 percent of such reductions in 2030.
- If new nuclear, renewable, and fossil plants with CCS are not deployed rapidly enough, covered entities are projected to turn to increased natural gas use to offset reductions in coal generation, resulting in markedly higher delivered prices of natural gas.
- Emissions reductions in the residential, commercial, industrial, and transportation sectors are small relative to those in the electric power sector, and energy price increases are not large enough to induce consumers to make large changes in their energy use.
- Coal consumption is significantly reduced, and total coal consumption in 2030 ranges between 62 and 89 percent below the Reference Case level.
- GHG allowance prices are sensitive to the cost and availability of low-carbon generating technologies and emissions offsets. Estimated allowance prices range from \$30 to \$76/mtCO_2e in 2020 and from \$61 to \$156/mtCO_2e in 2030.
- S. 2191 increases energy prices and energy bills for consumers. Relative to the Reference Case, the price of using coal for power generation is 161 - 413 percent higher in 2020 and 305 - 804 percent higher in 2030. The price of electricity is 5 - 27 percent higher in 2020 and 11 - 64 percent higher in 2030. Under S. 2191,

average annual household energy bills, excluding transportation costs, are $30 - $325 higher in 2020 and $76 - $723 higher in 2030.

- S. 2191 increases the cost of using energy, which reduces real economic output, reduces purchasing power, and lowers aggregate demand, and GDP falls relative to the Reference Case. Adverse economic impacts increase over time, and discounted GDP losses, 2009 – 2030, range from $444 billion (-0.2 percent) to $1,308 billion (-0.6 percent) -- Table III-6.
- S. 2191 impacts industrial activity, including manufacturing, to a greater extent than the overall economy. Industrial shipments in 2030 are reduced by $233 - $589 billion (-2.9 to -7.4 percent).

Table III-6
Macroeconomic Impacts of S. 2191 Cases and S. 1766 Update Cases
(billion 2000 dollars, except where noted)

	S. 2191 Cases					S1766 Update
	Core	High Cost	Limited Alternatives	No International Offsets	Limited Alternatives No International	
Cumulative Real Impacts 2009-2030 (Present Value using 4% Discount Rate)						
GDP						
Change	(444)	(729)	(912)	(546)	(1,306)	(66)
Percent Change	-0.2%	-0.3%	-0.4%	-0.2%	-0.6%	-0.03%
Consumption						
Change	(558)	(785)	(946)	(780)	(1,422)	(145)
Percent Change	-0.3%	-0.5%	-0.6%	-0.5%	-0.9%	-0.1%
Industrial Shipments (excludes services)						
Change	(1,340)	(1,723)	(2,031)	(2,430)	(3,684)	(722)
Percent Change	-1.3%	-1.7%	-2.0%	-2.4%	-3.6%	-0.7%
Nominal Revenue collected 2012-2030[a]	2,851	3,650	4,282	4,416	7,659	987

Source: U.S. Energy Information Administration, 2008.

EIA, January 2007

This EIA report responded to a request from Senators Bingaman, Landrieu, Murkowski, Specter, Salazar, and Lugar for an analysis of a proposal that would regulate GHG emissions through a cap-and-trade system. The proposal was modeled using NEMS and compared to the reference case projections from the *Annual Energy Outlook 2006* (AEO 2006).[37] The major findings included:

- The proposal leads to lower GHG emissions, but the intensity reduction targets are not fully achieved after 2025.
- Relative to the reference case, covered GHG emissions less offsets are 562 $MMTCO_2e$ (7.4 percent) lower in 2020 and 1,259

[37]U.S. Energy Information Administration, *Energy Market and Economic Impacts of a Proposal to Reduce Greenhouse Gas Intensity With a Cap and Trade System*, SR/OIAF/2007-01, January 2007.

$MMTCO_2e$ (14.4 percent) lower in 2030 in the Phased Auction case. Covered GHG emissions grow by 24 percent between 2004 and 2030, about half the increase in the reference case.

- Initially, when allowance prices are relatively low, reductions in GHG emissions outside the energy sector are the predominant source of emissions reductions. By 2030, the reduction in energy related CO_2 emissions account for most emissions reductions.
- In 2004 dollars, the allowance prices rise from \$3.70/$mtCO_2$ in 2012 to the safety valve price of \$14.18/$mtCO_2$ in 2030.
- The cost of GHG allowances is passed through to consumers, raising the price of fossil fuels charged and providing an incentive to lower energy use and shift away from fossil fuels.
- The average delivered price of coal to power plants in 2020 increases from \$1.39/MMBTU in the reference case to \$2.06, an increase of 48 percent. By 2030 the change grows from \$1.51/ MMBTU to \$2.73/ MMBTU, an increase of 81 percent.
- Electricity prices are lower in the Phased Auction case than in the Full Auction case because the Phased Auction provides a portion of the allowances to the electric power sector for free.
- Relative to the reference case, annual per household energy expenditures in 2020 are 2.6 percent (\$41) higher in the Phased Auction case and 3.6 percent (\$58) higher in the Full Auction case. By 2030, projected annual household energy expenditures range from 7.0 percent to 8.1 percent (\$118 to \$136) higher.
- Coal use is projected to continue to grow, but at a much slower rate than in the reference case. Total energy from coal increases by 23 percent between 2004 and 2030, less than half the 53 percent increase projected in the reference case.
- The proposal significantly increases nuclear capacity additions and generation. The projected 47 GW increase in nuclear capacity between 2004 and 2030 allows nuclear to continue to provide about 20 percent of U.S. electricity in 2030.
- The proposal adds significantly to renewable generation. In the reference case, renewable generation is projected to increase from 358 BkWh in 2004 to 559 BkWh in 2030.
- Retail gasoline prices in 2030 are 11 ¢/gal higher in 2030, leading to modest changes in vehicle purchase and travel decisions.
- The Phased Auction and Full Auction cases have similar energy market impacts, but the macroeconomic impacts differ – Table III-7.
- In the Phased Auction case, wholesale energy prices rise steadily and, by 2030, are 12 percent above the reference case levels. This represents 8 percent higher energy prices at the consumer level by 2030 and a 1 percent increase in the CPI.
- In the Phased Auction case, discounted total GDP (2000 dollars) over the 2009-2030 time period is \$232 billion (0.10 percent) lower than in the reference case, while discounted real consumer

spending is $236 billion (0.14 percent) lower. In 2030, in the Phased Auction case, real GDP is $59 billion (0.26 percent) lower and consumption expenditures are $55 billion (0.36 percent) lower.

Table III-7
Economic Impacts of Phased and Full Auction Cases

Projection	2004	2020			2030		
		AEO2006 Reference	Phased Auction	Full Auction	AEO2006 Reference	Phased Auction	Full Auction
Allocation of Allowance Revenue (billion nominal dollars)							
Private Spending	-	-	39.0	0.0	-	58.6	0.0
States	-	-	21.4	0.0	-	54.9	0.0
Government Spending	-	-	0.0	0.0	-	0.0	0.0
Debt Reduction	-	-	13.3	73.7	-	86.4	199.9
Total Revenue	-	-	73.7	73.7	-	199.9	199.9
Aggregate Prices in the Economy							
WPI – Fuel & Power (1982 =1.0)	1.27	1.77	1.88	1.88	2.49	2.79	2.79
CPI – Energy (1982/84 = 1.0)	1.51	2.19	2.27	2.28	2.96	3.20	3.20
CPI – All Urban (1982/84 = 1.0)	1.89	2.86	2.88	2.87	3.78	3.82	3.80
Inflation Rate, Unemployment Rate and the Federal Funds Rate (percent)							
Inflation	2.68	3.06	3.13	3.10	2.67	2.68	2.68
Unemployment Rate	5.53	4.37	4.44	4.46	4.90	5.01	5.02
Federal Funds Rate	1.35	5.24	5.24	5.16	5.04	4.96	4.86
Components of GDP (billion 2000 dollars)							
GDP	10,756	17,541	17,520	17,503	23,112	23,053	23,018
Disposable Income	8,004	13,057	13,037	12,991	17,562	17,468	17,367
Consumption	7,589	11,916	11,898	11,880	15,352	15,298	15,247
Investment	1,810	3,293	3,291	3,288	4,985	4,990	4,973
Government	1,952	2,464	2,474	2,464	2,838	2,861	2,839
Exports	1,118	3,776	3,759	3,765	6,833	6,785	6,813
Imports	1,719	3,659	3,660	3,647	6,156	6,165	6,121

Source: U.S. Energy Information Administration, 2008.

IV. IMPACTS OF CO_2 REGULATION ON THE NATIONAL ECONOMY

IV.A. Summary Results of Studies

To estimate the likely effects of the EPA Endangerment Finding, we used the findings of various comprehensive studies conducted in recent years of the impacts of carbon restrictions on the U.S. economy, jobs, and energy markets. As discussed in Chapter III, these studies were conducted over the years by a number of organizations and analyzed a variety of proposed carbon restriction programs. As might be expected, their findings differed depending on the proposal being assessed, 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 Finding 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:

- In 2009, ACCF and NAM estimated that ASCEA would reduce U.S. GDP by more than $570 billion.
- In 2009, NBCC estimated that ASCEA would reduce U.S. GDP by about $250 billion.
- In 2009, the Heritage Foundation estimated that ASCEA would reduce U.S. GDP by $525 billion.
- In 2009, the Brookings Institution estimated that ASCEA would reduce U.S. GDP by $430 billion.
- In 2009, CAAE estimated that the carbon restrictions contained in the Obama Administration's FY 2010 budget proposals would reduce U.S. GDP by about $50 billion.
- In 2008, the Heritage Foundation estimated that the proposed Lieberman-Warner Bill would reduce U.S. GDP by $450 billion.
- In 2008, ACCF and NAM estimated that the proposed Lieberman-Warner Bill would reduce U.S. GDP by $65 billion.
- In 2008, EIA estimated that the proposed Lieberman-Warner Bill would reduce U.S. GDP by $450 billion.
- In 2007, EIA estimated that a U.S. Senate proposal to restrict carbon emissions would reduce U.S. GDP by $230 billion.

Second, the studies forecast that carbon restrictions would significantly reduce U.S. employment over the next two decades. For example, by 2030:

- In 2009, ACCF and NAM estimated that ASCEA would result in the loss of 2.4 million U.S. jobs.

- In 2009, NBCC estimated that ASCEA would result in the loss of 2.2 million U.S. jobs.
- In 2009, the Heritage Foundation estimated that ASCEA would result in the loss of 1.5 million U.S. jobs.
- In 2009, the Brookings Institution estimated that ASCEA would result in the loss of 700,000 U.S. jobs.
- In 2009, CAAE estimated that the carbon restrictions contained in the Obama Administration's FY 2010 budget proposals would result in the loss of 3.2 million U.S. jobs.
- In 2008, the Heritage Foundation estimated that the proposed Lieberman-Warner Bill would result in the loss of 450,000 U.S. jobs.
- In 2008, ACCF and NAM estimated that the proposed Lieberman-Warner Bill would result in the loss of 3.5 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:

- In 2009, ACCF and NAM estimated that ASCEA would result in a reduction in average household income of about $1,250.
- In 2009, NBCC estimated that ASCEA would result in a reduction in average household income of about $900.
- In 2009, the Heritage Foundation estimated that ASCEA would result in a reduction in average household income of about $2,700
- In 2009, CBO estimated that ASCEA would result in a reduction in average household income of about $1,000.
- In 2009, CAAE estimated that the carbon restrictions contained in the Obama Administration's FY 2010 budget proposals would result in a reduction in average household income of about $2,130.

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 regulations such as the Endangerment Finding. The price increases would be essential to the 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. 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 Finding 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 Finding 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, in 2009 ACCF and NAM estimated that by 2030 ASCEA 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

In 2009, NBCC estimated that by 2030 ASCEA would increase (above the 2030 reference case):

- Natural gas prices by 17 percent
- Motor fuel prices by 7 percent
- Electricity prices by 24 percent

In 2009, 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

In 2009, EIA estimated that by 2030 ASCEA would increase (above the 2030 reference case):

- Gasoline prices by $1.50/gal.
- Jet fuel prices by 90¢/gal.
- Diesel prices by 80¢/gal
- Residential natural gas prices by $5/mcf
- Electricity prices by $3.70/kWh
- Coal prices to the electric power sector by $6.65 per MMBTU

In 2009, CAAE estimated that by 2030 the carbon restrictions contained in the Obama Administration's FY 2010 budget proposals would increase (above the 2030 reference case):

- Motor fuel prices by 20 percent
- Electricity prices by 51 percent
- Natural gas prices by 53 percent

In 2008, the Heritage Foundation estimated 2008 that by 2030 the proposed Lieberman-Warner Bill would increase (above the 2030 reference case):

- Electricity prices by $550 per year
- Natural gas prices by $300 per year
- Heating oil prices by $600 per year

In 2008, EIA estimated that the proposed Lieberman-Warner Bill would increase (above the 2030 reference case):

- Gasoline prices by 60¢/gal.
- Jet fuel prices by $1.00/gal.
- Diesel prices by 70¢/gal
- Residential natural gas prices by $7/mcf
- Electricity prices by $3.20/kWh
- Coal prices to the electric power sector by $7.20 per MMBTU

IV.B. Impacts on GDP, Jobs, and Incomes

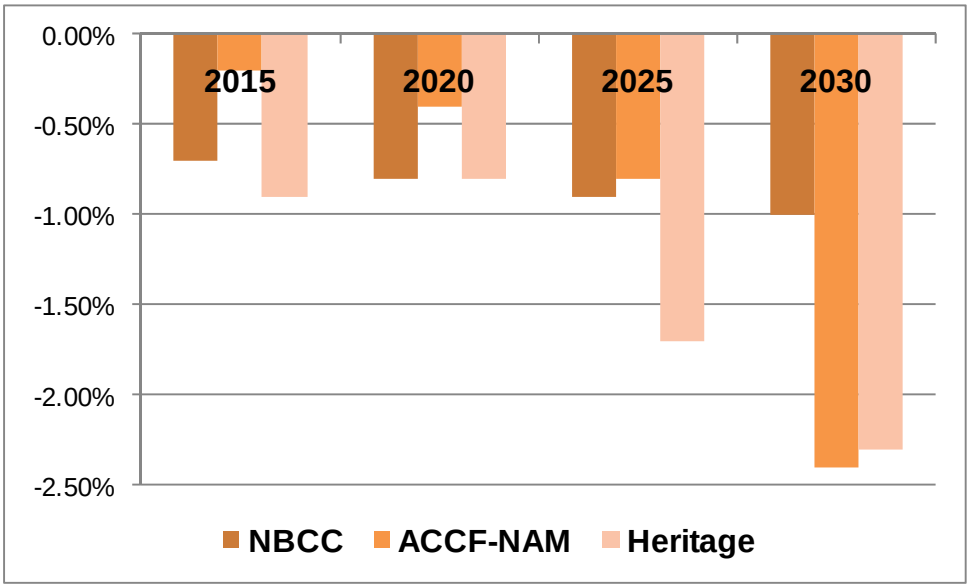
Here we relied heavily on the studies of the impact of ASCEA conducted in 2009 by ACCF/NAM, NBCC, and the Heritage Foundation. These three studies are recent, comprehensive, detailed, and credible. Further, the ACCF/NAM and the Heritage Foundation studies estimated impacts by state – which are of interest here.

The EPA Finding would significantly increase energy costs, and these higher fuel prices "force" the economy to undergo a significant shift in fuel conversion technology selection and utilization and fossil fuel consumption to satisfy the regulation. This results in reduced wages and incomes, lower commercial and industrial output, and lower employment and thus causes losses in GDP over the forecast period. As shown in Figure IV-1, the three studies forecast significant declines in GDP from the reference case, although with some variations, both in total and year-by-year.

Carbon restrictions will create substantial job losses due to reduced revenues resulting from higher fuel and electricity costs. This is primarily a result of higher carbon prices causing higher fuel costs for industry and higher costs to industry to comply with the emissions limits. The major causes of job losses are lower industrial output due to higher energy prices, the high cost of complying with required emissions cuts, and greater competition from overseas manufacturers with lower energy costs.

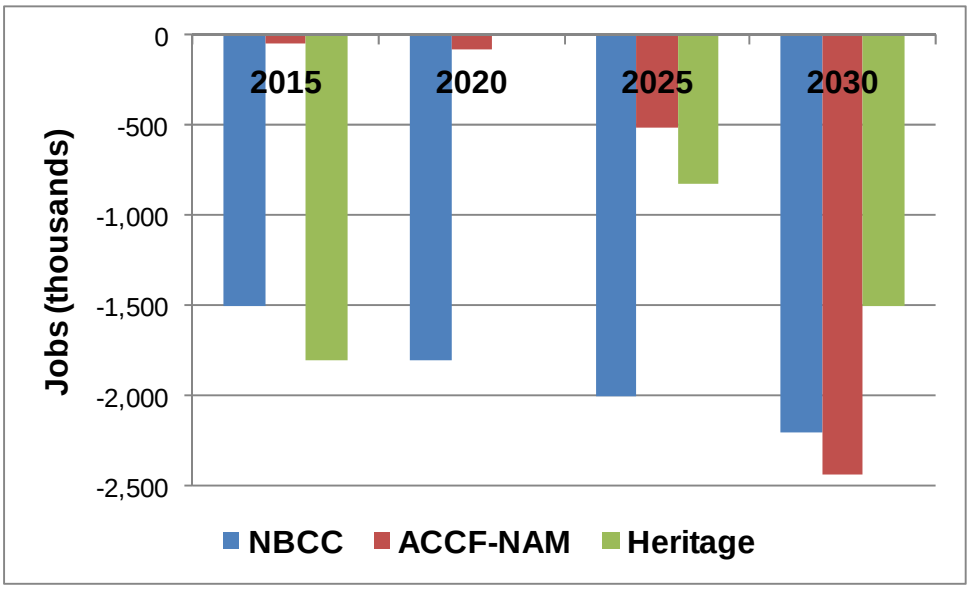
These job losses are net of any new jobs that may be generated by increased spending on renewable energy, energy efficiency, clean coal technologies, or other programs. Figure IV-2 shows that the ACCF/NAM estimates of job losses are less than those from NBCC and Heritage until 2030, when the opposite is the case. In general, NBCC forecasts the most jobs losses from ASCEA.

Figure IV-1
Likely Impact of ASCEA on U.S. GDP



Source: Management Information Services, Inc., 2010.

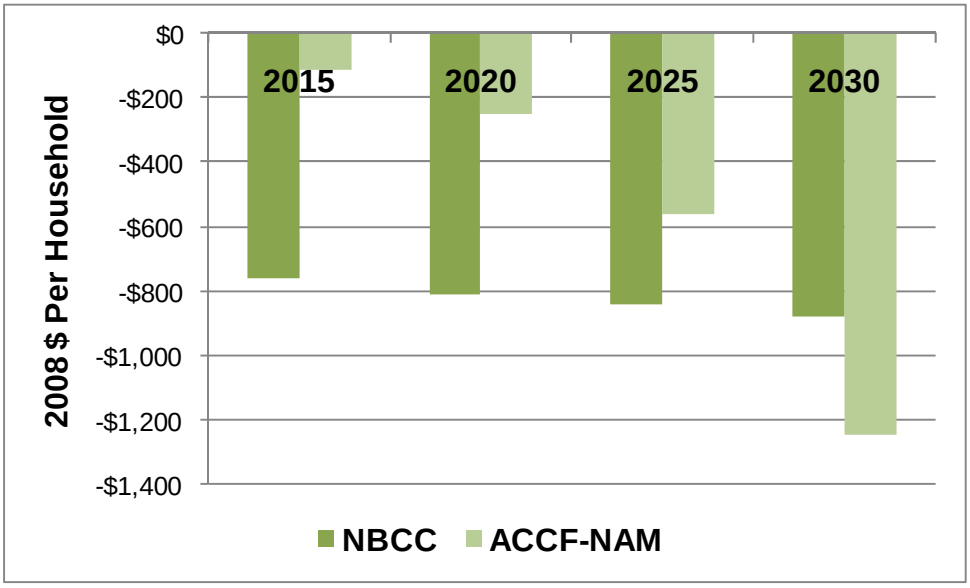
Figure IV-2
Likely Impact of ASCEA on U.S. Jobs



Source: Management Information Services, Inc., 2010.

ASCEA will cause significant household income losses resulting from higher payments for fuels and electricity. Higher energy prices will have ripple impacts on prices throughout the economy and will impose financial costs that increase every year. Although ASCEA (unlike the EPA Endangerment Finding) provides some consumer relief for electricity and natural gas customers during the early years, higher energy prices would ultimately impose a financial cost of up to $1,250 per household by 2030 – Figure IV-3.

Figure IV-3
Household Income Losses Resulting From ASCEA

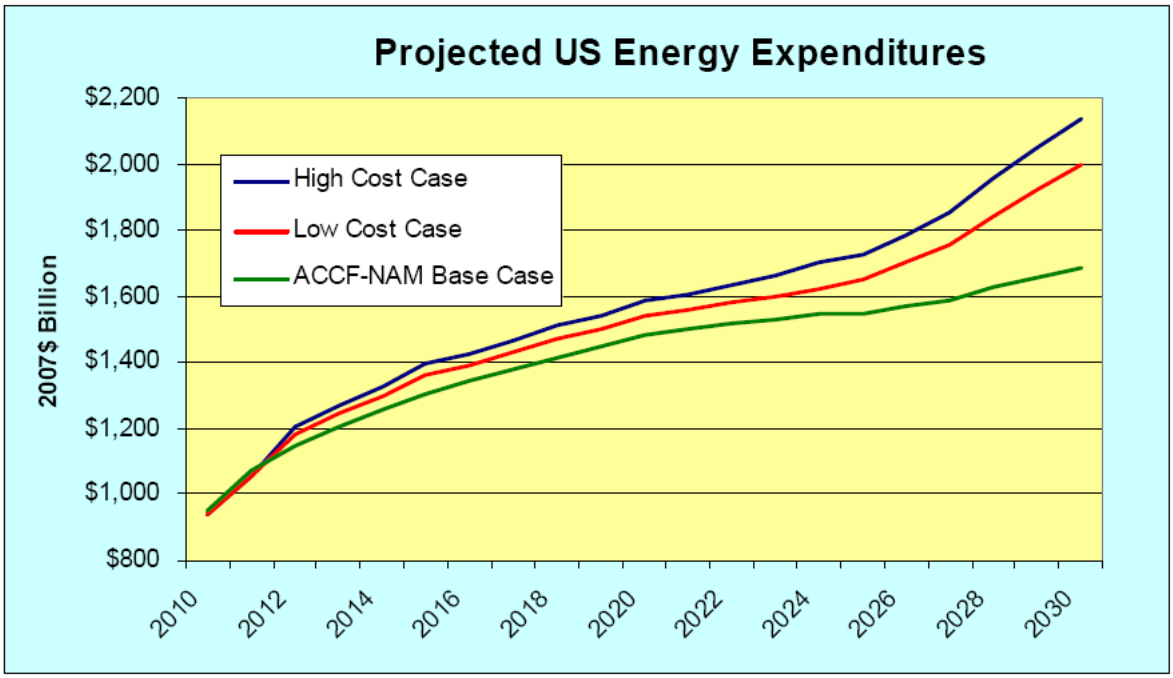


Source: Management Information Services, Inc., 2010.

IV.C. Impacts on Energy Expenditures

By 2030, ASCEA could cause gross U.S. energy expenditures to increase by nearly 30 percent – Figure IV-4. These significant increases reflect the impacts of increased fuel costs and changes to energy conversion technology infrastructure costs. The estimates shown in the figure include consumer price rebates for electricity, natural gas, and home heating oil purchases based on partial return of free allowance allocations – none of which pertain to the EPA Endangerment Finding.

Figure IV-4
Forecast Increase in U.S. Energy Expenditures Resulting From ASCEA



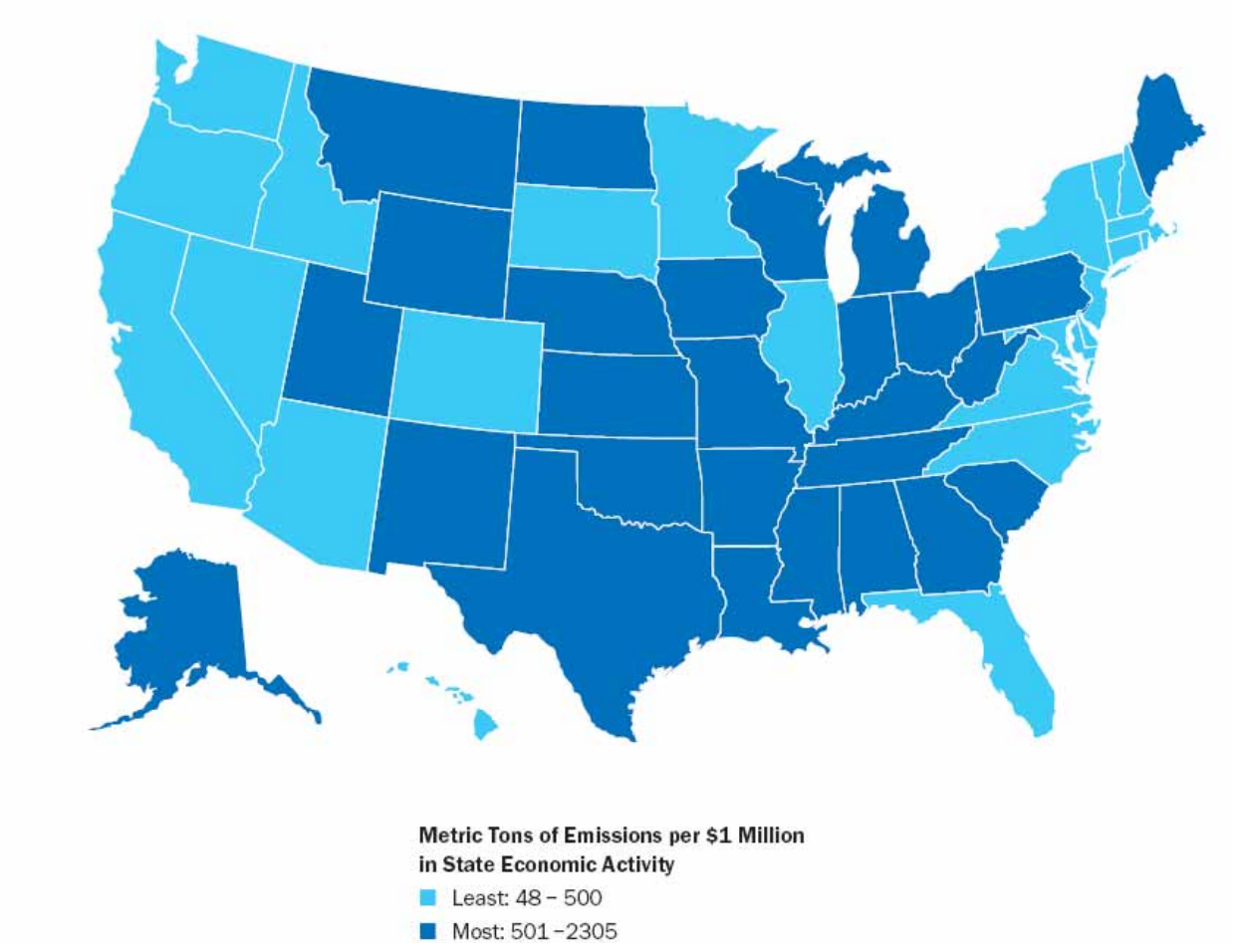
Source: American Council for Capital Formation and the National Association of Manufacturers.

V. STATE IMPACTS

V.A. Impacts of CO_2 Restrictions on Individual States

The states with the highest CO_2 emissions per dollar of economic activity will face the greatest difficulties and highest costs in reducing emissions. As shown in Figure V-1 and Table V-1, states in the south and the Midwest will be especially impacted.[38]

Figure V-1
Relative CO_2 Emissions Per State



Source: U.S. Environmental Protection Agency, 2009.

[38]Figure V-1 is from U.S. Environmental Protection Agency, "Energy CO_2 Emissions by State," 2009; Table V-1 is from American Petroleum Institute, "Waxman Markey Impact," October 2009.

Table V-1
CO_2 Emissions Ranked by State

Rank	State	Total CO_2 Emissions (2005 MMT CO_2)
1	Texas	663.87
2	California	390.64
3	Pennsylvania	277.00
4	Ohio	269.97
5	Florida	260.74
6	Illinois	242.81
7	Indiana	231.59
8	New York	210.91
9	Louisiana	191.56
10	Michigan	189.58
11	Georgia	184.00
12	North Carolina	153.51
13	Kentucky	152.15
14	Missouri	141.11
15	Alabama	141.10
16	New Jersey	134.54
17	Virginia	128.93
18	Tennessee	127.25
19	West Virginia	113.13
20	Wisconsin	110.53
21	Oklahoma	106.09
22	Minnesota	100.65
23	Arizona	97.17
24	Colorado	94.34
25	South Carolina	87.24
26	Washington	85.61
27	Massachusetts	84.83
28	Maryland	83.91
29	Iowa	79.67
30	Kansas	72.46
31	Utah	66.06
32	Mississippi	63.56
33	Wyoming	62.87
34	Arkansas	60.54
35	New Mexico	58.98
36	Nevada	49.56
37	North Dakota	49.16
38	Alaska	47.12
39	Connecticut	43.30
40	Nebraska	43.10
41	Oregon	42.67
42	Montana	36.27
43	Hawaii	23.05
44	Maine	22.93
45	New Hampshire	21.21
46	Delaware	17.75
47	Idaho	15.83
48	South Dakota	13.19
49	Rhode Island	11.28
50	Vermont	6.79
51	District of Columbia	3.94

Rank	State	Total CO_2/ $ Millions of GSP
1	Wyoming	2,305.47
2	West Virginia	2,132.54
3	North Dakota	2,015.01
4	Montana	1,213.64
5	Alaska	1,198.64
6	Louisiana	1,138.84
7	Kentucky	1,082.90
8	Indiana	970.74
9	Alabama	930.69
10	Oklahoma	873.24
11	New Mexico	856.37
12	Mississippi	781.89
13	Utah	727.66
14	Iowa	701.63
15	Arkansas	697.84
16	Kansas	686.34
17	Texas	670.95
18	Missouri	653.09
19	South Carolina	623.05
20	Ohio	612.27
21	Nebraska	609.85
22	Pennsylvania	566.44
23	Tennessee	555.15
24	Wisconsin	510.94
25	Maine	509.83
26	Georgia	505.73
27	Michigan	503.88
28	Arizona	448.76
29	Nevada	445.12
30	North Carolina	442.86
31	Colorado	435.68
32	Illinois	433.57
33	Minnesota	429.12
34	Hawaii	426.69
35	South Dakota	426.56
36	Florida	387.26
37	New Hampshire	385.23
38	Virginia	366.37
39	Maryland	340.77
40	Idaho	335.57
41	Washington	320.28
42	Delaware	314.20
43	New Jersey	312.11
44	Oregon	295.73
45	Vermont	294.29
46	Massachusetts	260.29
47	Rhode Island	257.62
48	California	240.82
49	Connecticut	223.50
50	New York	220.18
51	District of Columbia	48.21

Source: American Petroleum Institute, 2009.

As noted in Chapter III, an August 2009 Heritage Foundation study found that ASCEA would burden families with thousands of dollars per year in direct and indirect energy costs.[39] The report forecast severe consequences -- including greatly increased energy costs, millions of jobs lost, and declining household incomes -- if Congress enacts ASCEA. It found that the Bill will affect each state differently, since some states are more energy-intensive than others (Table V-1), and because some rely heavily on manufacturing. Nevertheless, the costs in every state are significant, as are increases in electricity and gasoline prices. Moreover, the projected losses in jobs and Gross State Product (GSP) illustrate how each state's economy will affected by ASCEA. The study produced 50 state-by-state breakouts of the impact that ASCEA would have on jobs and the economy -- Table V-2

The impacts of ASCEA on state GSP and jobs were also estimated in the ACCF/NAM study – Tables V-3 and V-4. The details differ somewhat from the Heritage Foundation state estimates. For example, the Heritage estimates are given as annual averages in each state, whereas the ACCF/NAM findings are given as high and low impact estimates for 2020 and 2030. Nevertheless, the bottom line in both studies is that the impacts in each state will be significant and negative, and some states will be affected more adversely than others.

[39]David Kreutzer, Ph.D., Karen Campbell, Ph.D., William W. Beach, Ben Lieberman, and Nicolas Loris, *Impact of the Waxman–Markey Climate Change Legislation on the States*, op. cit..

Table V-2
Estimated Impact of ACESA on the States

	Average Personal Income Loss, 2012–2035 (in Millions)	Average GDP Loss, 2012–2035 (in Millions)	Average Non-Farm Job Loss, 2012–2035
Alabama	–$1,524	–$3,793	–19,090
Alaska	–$293	–$1,019	–2,051
Arizona	–$2,069	–$5,652	–24,472
Arkansas	–$868	–$2,182	–10,807
California	–$15,268	–$41,481	–134,396
Colorado	–$2,043	–$5,407	–19,870
Connecticut	–$1,910	–$4,948	–13,649
Delaware	–$347	–$1,376	–3,265
District of Columbia	–$376	–$2,147	–529
Florida	–$6,920	–$16,806	–66,938
Georgia	–$3,191	–$9,072	–38,389
Hawaii	–$507	–$1,408	–3,738
Idaho	–$475	–$1,170	–6,534
Illinois	–$5,318	–$13,947	–50,178
Indiana	–$2,107	–$5,639	–29,154
Iowa	–$1,070	–$2,952	–13,395
Kansas	–$1,036	–$2,684	–11,136
Kentucky	–$1,322	–$3,528	–16,254
Louisiana	–$1,564	–$4,945	–15,438
Maine	–$454	–$1,101	–5,209
Maryland	–$2,641	–$6,148	–17,781
Massachusetts	–$3,207	–$8,043	–21,810
Michigan	–$3,417	–$8,739	–39,445
Minnesota	–$2,173	–$5,834	–22,963
Mississippi	–$842	–$2,026	–10,694
Missouri	–$2,026	–$5,250	–23,058
Montana	–$323	–$784	–3,438
Nebraska	–$652	–$1,833	–7,137
Nevada	–$1,017	–$2,911	–9,279
New Hampshire	–$546	–$1,312	–6,060
New Jersey	–$4,291	–$10,650	–30,685
New Mexico	–$621	–$1,743	–6,209
New York	–$9,101	–$25,237	–55,878
North Carolina	–$3,091	–$9,139	–38,907
North Dakota	–$245	–$634	–2,361
Ohio	–$3,966	–$10,669	–46,065
Oklahoma	–$1,317	–$3,188	–12,622
Oregon	–$1,325	–$3,620	–15,644
Pennsylvania	–$4,888	–$12,152	–46,762
Rhode Island	–$417	–$1,073	–3,870
South Carolina	–$1,389	–$3,497	–18,572
South Dakota	–$291	–$776	–2,718
Tennessee	–$2,074	–$5,580	–25,628
Texas	–$9,187	–$26,128	–94,041
Utah	–$806	–$2,417	–11,170
Vermont	–$235	–$562	–2,667
Virginia	–$3,247	–$8,762	–26,604
Washington	–$2,697	–$7,122	–25,718
West Virginia	–$549	–$1,320	–5,611
Wisconsin	–$2,040	–$5,315	–26,759
Wyoming	–$258	–$721	–1,949

Source: Heritage Foundation, 2009.

Table V-3
Loss in State GDP Resulting From ASCEA
(2007 Dollars)

State	LOW CASE PROJECTION		HIGH CASE PROJECTION	
	2020	2030	2020	2030
Alabama	-444	-4676	-762	-6379
Alaska	-100	-1051	-171	-1434
Arizona	-662	-6976	-1138	-9517
Arkansas	-256	-2701	-440	-3685
California	-4954	-52208	-8513	-71226
Colorado	-638	-6722	-1096	-9171
Connecticut	-581	-6124	-999	-8355
Delaware	-236	-2487	-406	-3393
DC	-163	-1715	-280	-2340
Florida	-1955	-20607	-3360	-28113
Georgia	-1085	-11432	-1864	-15597
Hawaii	-158	-1665	-271	-2271
Idaho	-141	-1483	-242	-2024
Illinois	-1676	-17665	-2881	-24100
Indiana	-704	-7414	-1209	-10115
Iowa	-347	-3657	-596	-4990
Kansas	-310	-3262	-532	-4450
Kentucky	-418	-4402	-718	-6005
Louisiana	-483	-5089	-830	-6943
Maine	-992	-10457	-1705	-14267
Maryland	-719	-7573	-1235	-10331
Massachusetts	-132	-1392	-227	-1899
Michigan	-1144	-12058	-1966	-16450
Minnesota	-703	-7407	-1208	-10105
Mississippi	-234	-2467	-402	-3365
Missouri	-638	-6722	-1096	-9171
Montana	-85	-900	-147	-1228
Nebraska	-71	-750	-122	-1023
Nevada	-196	-2066	-337	-2819
New Hampshire	-163	-1722	-281	-2349
New Jersey	-1291	-13600	-2218	-18554
New Mexico	-322	-3397	-554	-4635
New York	-2958	-31171	-5083	-42526
North Carolina	-1057	-11142	-1817	-15201
North Dakota	-213	-2242	-366	-3059
Ohio	-1315	-13860	-2260	-18909
Oklahoma	-340	-3580	-584	-4884
Oregon	-446	-4697	-766	-6407
Pennsylvania	-1439	-15162	-2472	-20685
Rhode Island	-129	-1355	-221	-1848
South Carolina	-417	-4399	-717	-6001
South Dakota	-92	-969	-158	-1322
Tennessee	-680	-7164	-1168	-9774
Texas	-2836	-29887	-4874	-40775
Utah	-265	-2791	-455	-3807
Vermont	-70	-736	-120	-1004
Virginia	-1033	-10883	-1775	-14847
Washington	-821	-8653	-1411	-11805
West Virginia	-150	-1586	-259	-2163
Wisconsin	-647	-6815	-1111	-9297
Wyoming	-67	-710	-116	-968

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

Table V-4
Jobs Losses by State Resulting From ASCEA
(Thousands of jobs)

	LOW CASE PROJECTION		HIGH CASE PROJECTION	
State	2020	2030	2020	2030
Alabama	0.18	-27.94	-1.25	-38.05
Alaska	0.02	-4.28	-0.17	-5.82
Arizona	0.18	-29.61	-1.26	-40.32
Arkansas	0.10	-17.10	-0.70	-23.28
California	1.26	-221.27	-8.76	-301.36
Colorado	0.16	-26.32	-1.12	-35.85
Connecticut	0.12	-17.28	-0.82	-23.53
Delaware	0.03	-4.49	-0.19	-6.12
DC	0.02	-3.23	-0.14	-4.40
Florida	0.55	-90.63	-3.79	-123.43
Georgia	0.29	-47.72	-2.00	-64.99
Hawaii	0.05	-8.14	-0.32	-11.09
Idaho	0.05	-7.38	-0.31	-10.05
Illinois	0.57	-88.36	-3.97	-120.34
Indiana	0.28	-43.51	-1.95	-59.26
Iowa	0.15	-24.02	-1.01	-32.72
Kansas	0.13	-21.42	-0.90	-29.17
Kentucky	0.17	-25.71	-1.15	-35.01
Louisiana	0.15	-26.07	-1.07	-35.50
Maine	0.05	-6.59	-0.31	-8.98
Maryland	0.18	-30.44	-1.27	-41.45
Massachusetts	0.22	-32.08	-1.53	-43.70
Michigan	0.43	-66.66	-2.99	-90.79
Minnesota	0.25	-42.09	-1.77	-57.32
Mississippi	0.11	-16.59	-0.74	-22.60
Missouri	0.26	-43.26	-1.82	-58.91
Montana	0.03	-4.96	-0.21	-6.76
Nebraska	0.09	-14.42	-0.61	-19.63
Nevada	0.08	-12.72	-0.54	-17.32
New Hampshire	0.05	-6.97	-0.33	-9.50
New Jersey	0.29	-50.70	-2.03	-69.05
New Mexico	0.06	-9.33	-0.40	-12.71
New York	0.62	-108.26	-4.32	-147.44
North Carolina	0.27	-44.87	-1.88	-61.11
North Dakota	0.03	-5.31	-0.22	-7.23
Ohio	0.51	-79.76	-3.58	-108.63
Oklahoma	0.13	-22.10	-0.91	-30.10
Oregon	0.13	-23.45	-0.93	-31.94
Pennsylvania	0.41	-71.58	-2.86	-97.49
Rhode Island	0.04	-5.29	-0.25	-7.21
South Carolina	0.13	-21.02	-0.88	-28.63
South Dakota	0.04	-6.42	-0.27	-8.74
Tennessee	0.25	-38.20	-1.71	-52.03
Texas	0.85	-144.60	-5.93	-196.93
Utah	0.08	-13.31	-0.56	-18.12
Vermont	0.02	-3.36	-0.16	-4.57
Virginia	0.25	-41.40	-1.73	-56.39
Washington	0.24	-41.46	-1.64	-56.46
West Virginia	0.05	-8.21	-0.34	-11.18
Wisconsin	0.27	-41.66	-1.87	-56.74
Wyoming	0.02	-2.87	-0.12	-3.91

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

V.B. State Concentrations of the Black and Hispanic Populations

Table V-5 Indicates that the Hispanic population, while growing rapidly in both absolute and percentage terms, is becoming gradually more dispersed geographically throughout the U.S.:

- In 2000, about 86 percent of the Hispanic population was concentrated in ten states; by 2025, only 82 percent of a much larger Hispanic population will be residing in these states.
- In 2000, more than 73 percent of the Hispanic population was concentrated in five states – California, Texas, Florida, New York, and Illinois; by 2025, only 70 percent of a much larger Hispanic population will be residing in these five states.

Table V-6 Indicates that the Black population, while growing rapidly, is becoming gradually more concentrated geographically:

- In 2000, about 59 percent of the Black population was concentrated in ten states; by 2025, nearly 66 percent of a larger Black population will be residing in these states.
- In 2000, 36 percent of the Black population was concentrated in five states – New York, Texas, Florida, California, and Georgia; by 2025, 42 percent of a larger Black population will be residing in these five states.

Table V-5
Concentration of the Hispanic Population by State, 2000 and 2025

	Percent of Total U.S. Hispanic Population	
	2000	**2025**
California	34.0	34.6
Texas	18.7	16.7
Florida	7.6	8.0
New York	8.9	7.0
Illinois	4.0	3.7
Arizona	3.4	3.4
New Jersey	3.3	3.0
New Mexico	2.3	2.0
Colorado	1.9	1.7
Massachusetts	14	1.5
Total	85.5	81.6

Source: U.S. Bureau of the Census and Management Information Services, Inc, 2010.

Table V-6
Concentration of the Black Population by State, 2000 and 2025

	Percent of Total U.S. Black Population	
	2000	**2025**
New York	9.3	9.3
Texas	7.2	8.9
Florida	6.6	8.2
California	6.8	7.9
Georgia	6.4	7.6
North Carolina	4.9	5.2
Illinois	5.3	5.0
Maryland	4.2	4.8
Virginia	4.0	4.5
Louisiana	4.1	4.2
Total	58.8	65.6

Source: U.S. Bureau of the Census and Management Information Services, Inc., 2010.

V.C. Impacts on States Where Black and Hispanic Populations are Concentrated

African Americans and Hispanics are thus disproportionately located in certain states such as California, Texas, Florida, New York, and Illinois, and their populations will increase over time. For the seven states with the highest concentrations of Hispanics and African Americans – Arizona, California, Florida, Georgia, Illinois, New York, and Texas -- ASCEA would likely have the following impacts.

In Arizona, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $5.7 Billion
- Reduce personal income by $2.1 billion
- Destroy 24,500 jobs
- Increase electricity prices by $620 per household
- Increase gasoline prices by $0.62 per gallon

In California, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $41.5 billion
- Reduce personal income by $15.3 billion
- Destroy 134,400 jobs
- Increase electricity prices by $531 per household
- Increase gasoline prices by $0.72 per gallon

In Florida, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $16.8 billion
- Reduce personal income by $6.9 billion
- Destroy 76,000 jobs
- Increase electricity prices by $830 per household
- Increase gasoline prices by $0.65 per gallon

In Georgia, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $9.1 billion
- Reduce personal income by $3.2 billion
- Destroy 38,400 jobs
- Increase electricity prices by $677 per household
- Increase gasoline prices by $0.61 per gallon

In Illinois, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $14 billion
- Reduce personal income by $5.3 billion
- Destroy 50,200 jobs
- Increase electricity prices by $436 per household
- Increase gasoline prices by $0.63 per gallon

In New York, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $25.2 billion
- Reduce personal income by $9.1 billion
- Destroy 56,000 jobs
- Increase electricity prices by $371 per household
- Increase gasoline prices by $0.66 per gallon

In Texas, over the 2012–2035 timeframe, on average ASCEA would annually:

- Reduce GSP by $26.1 billion
- Reduce personal income by $9.2 billion
- Destroy 94,000 jobs
- Increase electricity prices by $891 per household
- Increase gasoline prices by $0.62 per gallon

VI. POPULATION AND DEMOGRAPHIC TRENDS

VI.A. Definitions of Race and Ethnicity

The classification of individuals by race and ethnicity is complex and controversial, and the concepts of race and ethnicity lack precise and universally accepted definition. Their economic and social significance depend on a variety of factors, including how individuals identify themselves and how others identify and treat them. Most of the primary data utilized in this report were obtained from Federal government statistical sources, and these are collected through household surveys and decennial censuses in which respondents are asked to identify their race in one question and whether or not they are of Hispanic origin in a separate question.

The basic racial categories used by the U.S. Bureau of the Census are American Indian or Alaska Native, Asian or Pacific Islander, Black, and White. The Bureau identifies Hispanic origin as an ethnicity, and Hispanics may be of any race. Here we use the following five categories:

- Hispanic -- which may be of any race
- White, not of Hispanic origin
- Black
- Asian, including Pacific Islander
- American Indian, including Alaska native (Alaskan Eskimo and Aleut)

African Americans represent a relatively homogeneous demographic category, while Hispanics are highly diverse. Hispanics are usually disaggregated into persons of Mexican, Puerto Rican, Cuban, and Other Hispanic Origin; the major groups in the latter category include Dominicans, Salvadorans, Guatemalans, Nicaraguans, Hondurans, Panamanians, Costa Ricans, Colombians, Ecuadorians, Peruvians, Chileans, and other Central and South Americans. Mexicans are the largest Hispanic group, comprising about 65 percent of the total, Puerto Ricans are the second largest, comprising about nine percent, and Cubans are the third largest, accounting for about four percent of U.S. Hispanics.[40]

VI.B. Black and Hispanic Populations

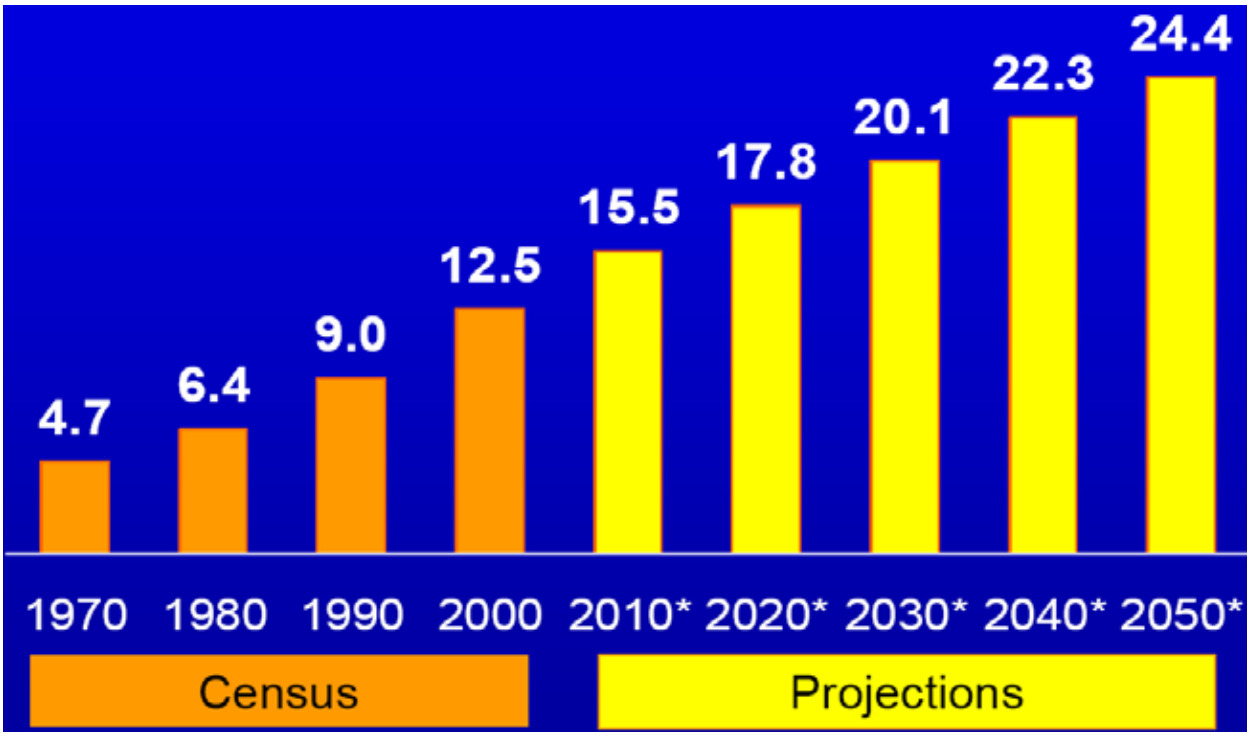
African Americans have been counted as a separate demographic group since the first U.S.
census was conducted in 1790, and we thus have a good historical record of the Black population. However, Hispanics have not always appeared in the census as a separate

[40]Pew Hispanic Center, "Country of Origin Profiles, October 2009.

ethnic group.[41] The Census Bureau makes population projections based on a high, middle, and low series, and on several variations within these series, and the major factors affecting future population growth are projected fertility rates, projected survival rates, and future net immigration. Variations in the assumed values of these variables can significantly affect the projections, and, obviously, the further into the future, the more the projections can vary. In this report, all of the population projections used are based on the Census Bureau's "middle" series.

Figure VI-1 indicates that the growth in the Hispanic population is the salient U.S. demographic development, both historical and forecast:[42]

Figure VI-1
Percent Hispanic of the Total U.S. Population: 1970 - 2050



Source: U.S. Census Bureau, 2010.

- In 1970, less than five percent of the U.S, population was Hispanic.
- In 2000, about 13 percent of the U.S, population was Hispanic.

[41]For example, the 1930 census contained a category for "Mexican," in the 1940 census the classification was "persons of Spanish mother tongue," in the 1950 and 1960 censuses the category was titled "persons of Spanish surname." The 1970 census asked persons about their "origin" and respondents could choose among several Hispanic origins listed on the questionnaire. In the 1980 and 1990 censuses persons of "Spanish/Hispanic" origin reported as Mexican, Puerto Rican, Cuban or other Hispanic, and the 1990 census tabulated information for 30 additional Hispanic-origin groups.
[42]U.S. Census Bureau, "Hispanics in the United States," 2009.

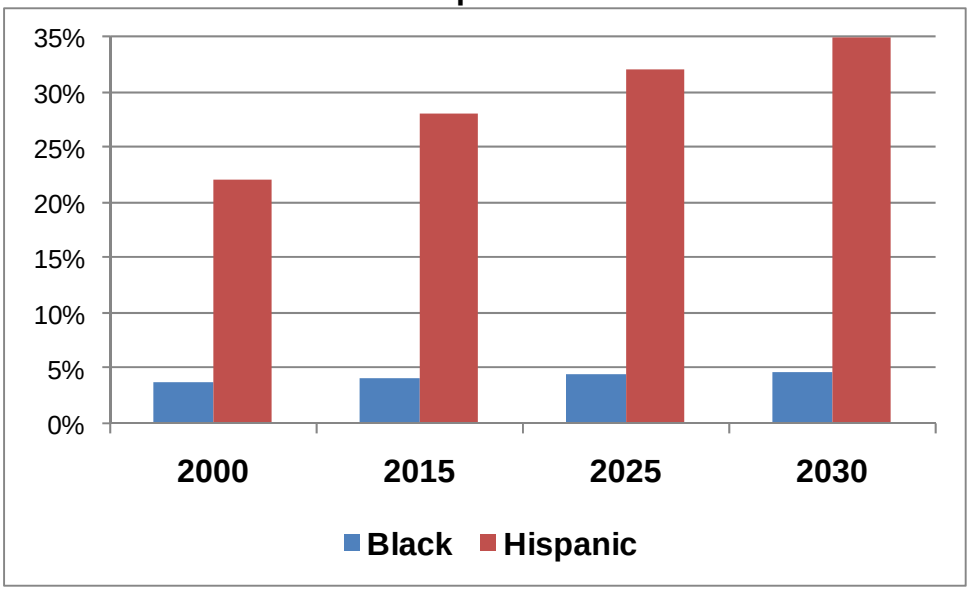
- In 2030, about 20 percent of the U.S, population will be Hispanic.
- In 2050, about 25 percent of the U.S, population will be Hispanic.
- In recent years, about one of every two persons added to the U.S. population was Hispanic.

Hispanics have displaced African Americans as the largest U.S. minority group, and their numerical dominance will continue to increase. The portion of the population that is non-Hispanic White declines from 80 percent in 1980 to about 50 percent in 2050. The portion of the U.S. that is Black will remain at about 13 percent over the next several decades.

VI.C. State Black and Hispanic Population Trends

The portions of the populations of the seven states of interest here comprised of African Americans and Hispanics will increase through 2030, as shown in Figures VI-2 through VI-8.

Figure VI-2
Portions of the Arizona Population Comprised of African Americans and Hispanics



Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

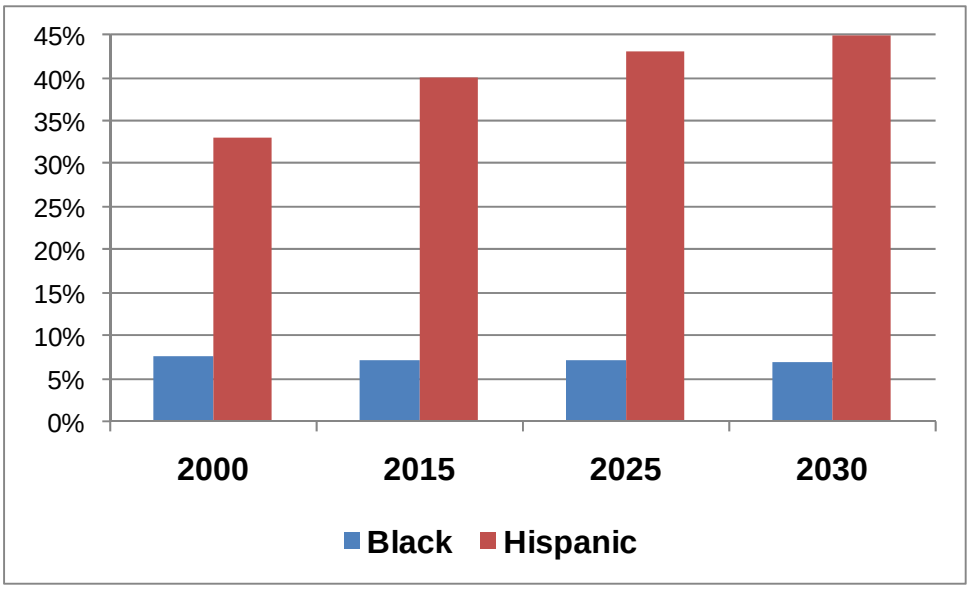
These figures reveal some important trends:

- In each of the seven states, both the Black percentage of the population and the Hispanic percentage of the population increases through 2030.

- In each of the seven states, both the Black percentage of the population and the Hispanic percentage of the population is higher in 2030 than in 2000.[43]
- As may be expected from the national trends, the increase in the Hispanic population is especially pronounced. For example:
  -- The percent of the Arizona population comprised of Hispanics increases from 22 percent in 2000 to 35 percent in 2030
  -- The percent of the California population comprised of Hispanics increases from 33 percent in 2000 to 45 percent in 2030
  -- The percent of the Florida population comprised of Hispanics increases from 16 percent in 2000 to 28 percent in 2030
  -- The percent of the Texas population comprised of Hispanics increases from 30 percent in 2000 to 40 percent in 2030.
- The rate of growth of the Hispanic population is much higher than that of the Black population, and even in states such as Illinois and New York where in 2000 African Americans outnumbered Hispanics, by 2030 the reverse is true.
- Trends in these states reflect the fact that the U.S. is becoming a "minority majority" nation, and by 2030 in both California and Texas African Americans and Hispanics combined will comprise a majority of the population.
- By 2030, in Arizona, Florida, Georgia, and New York, African Americans and Hispanics combined will comprise 40 percent or more of the population.

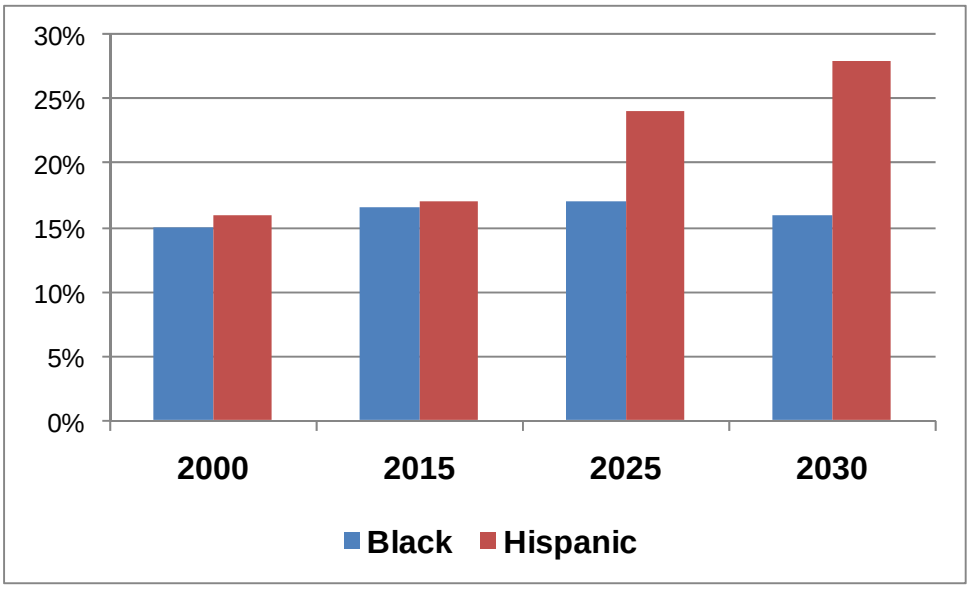
[43]Except for African Americans in California.

Figure VI-3
Portions of the California Population Comprised of African Americans and Hispanics



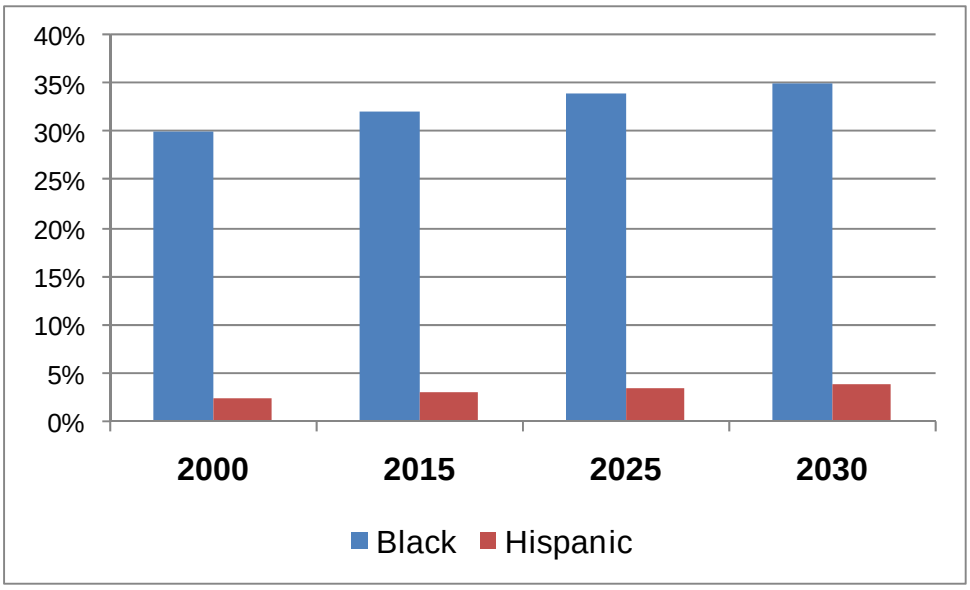
Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

Figure VI-4
Portions of the Florida Population Comprised of African Americans and Hispanics



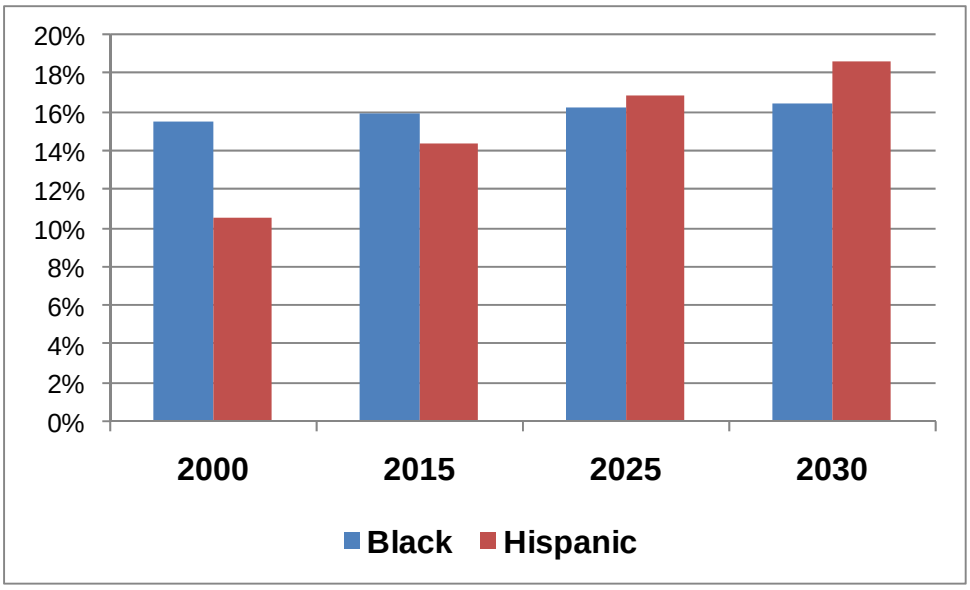
Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

Figure VI-5
Portions of the Georgia Population Comprised of African Americans and Hispanics



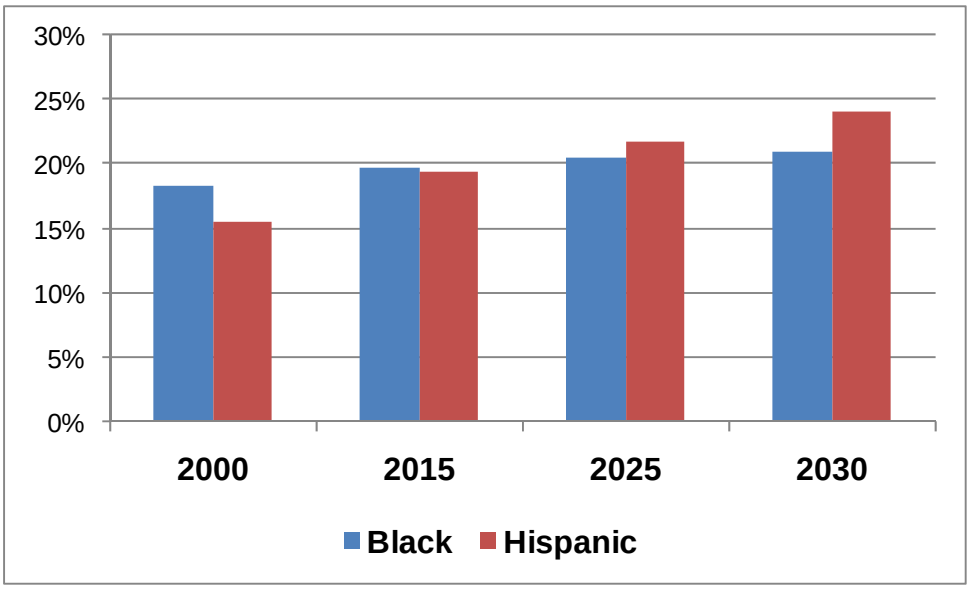
Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

Figure VI-6
Portions of the Illinois Population Comprised of African Americans and Hispanics



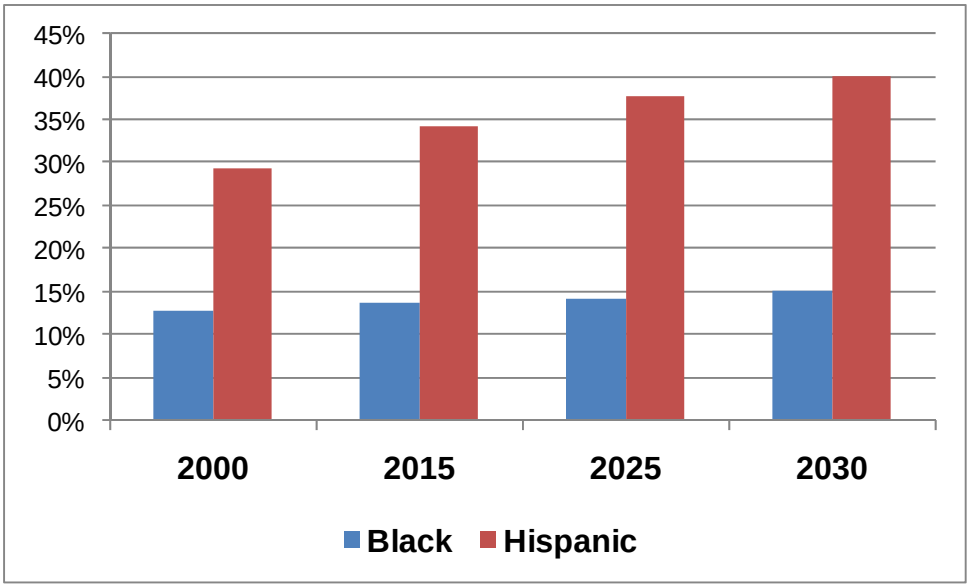
Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

Figure VI-7
Portions of the New York Population Comprised of African Americans and Hispanics



Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

Figure VI-8
Portions of the Texas Population Comprised of African Americans and Hispanics



Source: U.S. Census Bureau and Management Information Services, Inc., 2010.

VII. IMPACTS OF THE EPA ENDANGERMENT FINDING ON LOW-INCOME PERSONS, AFRICAN AMERICANS AND HISPANICS

VII.A. Economic Status of African Americans and Hispanics

VII.A.1. Income, Earnings, and Wealth

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:[44]

- Black incomes are only about 65 percent that of the U.S. average, and these disparities will be exacerbated if the EPA Endangerment Finding is implemented.
- Hispanic incomes are only about 74 percent that of the U.S. average, and these disparities will be exacerbated if the EPA Endangerment Finding is implemented.
- The income of White families is nearly twice that of Black and Hispanic families.
- The average weekly earnings of African Americans 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 African Americans 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.[45] 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:[46]

[44]Data based on 2009 and 2010 Census Bureau sources.
[45]See the discussion in Constance F. Citro and Robert T Michael, eds. *Measuring Poverty: A New Approach*, Washington, D.C.: National Academy Press, 1995.
[46]"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.

- 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 African Americans it was 24.7 percent
- Thus, the poverty rate for African Americans is slightly higher than that for Hispanics, and the poverty rates for African Americans 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 African Americans and Hispanics has historically been about three times that of Whites.
- Poverty rates among the elderly are considerably higher for African Americans 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 African Americans and Hispanics are well above those of Whites.

Incomes, earnings, and poverty rates thus indicate that African Americans and Hispanics are
significantly less well off than Whites:

- The net worth of White households is nearly five times that of Black and Hispanic households.[47]
- Even among households with similar monthly incomes, net asset holdings are far higher among Whites than African Americans or Hispanics.

VII.A.2. The Economic Vulnerability of African Americans and Hispanics

By virtually every measure of economic well being and security, African Americans and Hispanics are worse off than Whites, and they tend to be especially

[47]Net worth is defined as the sum of the market value of the assets owned by household members minus liabilities (secured and unsecured). Assets not included are the cash value of life insurance policies, equities in pension plans, and value of home furnishings and jewelry.

vulnerable to the economic downturn and job losses likely to result from implementing the EPA CO_2 restrictions.[48] 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 African Americans and Hispanics, which has remained relatively constant over the past four decades.
- Poverty rates for African Americans 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 Finding:

- Whites have, on average, a net worth that is nearly five times that of African Americans 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 African Americans and Hispanics, and these assets are more than three times as large of those owned by African Americans and Hispanics. This also gives Whites a much better capacity to cope with downturns in the economy.
- African Americans and Hispanics are much less likely than Whites to have discretionary income, and the amount of discretionary income they have is less.[49]
- African Americans 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 regulation will be disproportionately felt by African Americans and Hispanics
- African Americans and Hispanics are disproportionately concentrated in jobs that pay the minimum wage or below.

[48]Data in this section were obtained from the U.S. Department of Labor, the U.S. Census Bureau, and the Federal Reserve Board, 2010.

[49]Discretionary income is estimated by first subtracting Federal, state, and local income, payroll, and property taxes from household income to yield disposable income. Next, basic, necessary household expenses are subtracted from disposable income. The resulting figure is multiplied by 0.75 to yield a conservative estimate of discretionary income.

- African Americans and Hispanics have a much lower rate of home ownership than do Whites.
- About 20 percent of African Americans lack health insurance and about one-third of Hispanics lack health insurance.

VII.A.3. Implications for African Americans and Hispanics

The impacts of EPA CO_2 restrictions 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. African Americans and Hispanics are vulnerable and will experience disproportionately large negative effects:

- The unemployment rates for African Americans 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 regulation are likely to disproportionately harm African Americans 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.
- African Americans and Hispanics have relatively little discretionary income, and are especially vulnerable to the income losses that will result from the EPA Finding.
- Both African Americans and Hispanics are disproportionately affected by energy price increases and resulting economic disruptions, as was illustrated during the "energy crisis" of the 1970's.[50]

It is therefore especially important to estimate the impact of the EPA proposed regulation on African Americans 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. In addition, as noted, the Black and Hispanic populations are heavily concentrated within a relatively small number of states. A previous study estimated the potential impact of the McCain-Lieberman Bill on Hispanics at the national

[50]See Management Information Services, Inc., *Impacts on Hispanics of Federal Electric Utility Multiple Emissions Legislation*, Washington, D.C., April 2003.

level;[51] here we focus on the impact of the EPA rule on African Americans and Hispanics nationally and in Arizona, California, Florida, Georgia, Illinois, New York, and Texas.

VII.A.4. Implications for Energy Burdens on Low Income Groups and Minorities

The "energy burden" is defined as the percentage of gross annual household income that is used to pay annual residential energy bills.[52] The energy burden concept can be used to compare energy expenditures among households and groups of households.[53] 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).

Energy burden is a function of income and energy expenditures. 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 VII-1, in 2001:

- 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 – rising energy costs force hard decisions about what bills to pay: Housing, food, education, health care, and other necessities.

[51] *Potential Impact on Hispanics of S. 139, the McCain-Lieberman Bill*. Report prepared for Americans for Balanced Energy Choices, Management Information Services, Inc., Washington, D.C., September 2003.

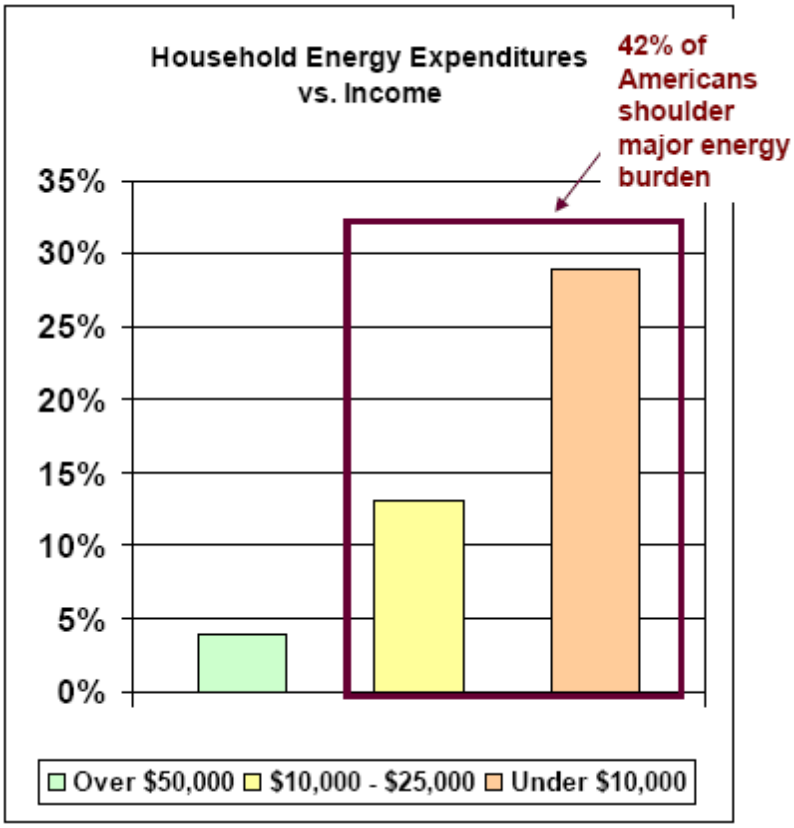
[52] The individual household energy burden is calculated for each household and then averaged within income/origin categories. See the discussion in Applied Public Policy Research Institute for Study and Evaluation, *LIHEAP Energy Burden Evaluation Study*, report prepared for the Office of Community Services, U.S. Department of Health and Human Services, July 2005.

[53] The concept is often used in the Low Income Home Energy Assistance Program (LIHEAP) to estimate required payments. The statutory intent of LIHEAP is to reduce home heating and cooling costs for low-income households.

The energy burden is even more discriminatory for low-income African Americans 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.

FigureVII-1



Source: American Association of African Americans in Energy.

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.

Cost increases for any basic necessity 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.

Tables VII-1 and VII-2 show 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 those households' energy needs. The national average for energy costs as a percentage of household income is about 12 percent.[54]

Table VII-2 shows that 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 VII-3. 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.

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. As a result, these families have experienced a rapidly diminishing quality of life as they become increasingly unable to provide for their most basic needs.

Across racial categories, minority families are statistically more likely to be found among the lowest-income households. Table VII-4 shows that Hispanic, and especially Black, families are disproportionately found in the lower income categories.

[54]Sources for these statistics are shown in the table in the following page.

Table VII-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)[55]	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[56]	$5,171	$17,491	$32,129	$77,338	$52,586
Residential Energy Cost[57]	$1,545	$1,883	$2,181	$2,729	$2,227
Transportation Energy Cost[58]	$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 % of Income	59.7%	25.7%	22.1%	10.0%	11.9%

Source: Various sources as shown in the footnotes below.

[55] *Current Population Survey, Annual Social and Economic Supplement*, U.S. Bureau of the Census, 2008.

[56] Effective federal tax rates for these income categories have been interpolated from the tax rates by income quintile as reported in Congressional Budget Office, "Effective Federal Tax Rates Under Current Law, 2001 to 2014," (August 2004). Estimates of state income tax rates were taken from Federation of Tax Administrators, http://www.taxadmin.org/fta/rate/ind_inc.html.

[57] Household energy consumption levels are estimated by income and race from U.S. Department of Energy, Energy Information Administration, "Residential Energy Consumption Survey (2001)." These consumption data have been updated for 2008 with residential energy price projections contained in U.S. Department of Energy, Energy Information Administration, "Short-Term Energy Outlook," June 2008.

[58] Energy use estimates for transportation per household by income category and race are taken from U.S. Department of Energy, Energy Information Administration, "Household Vehicles Energy Use: Latest Data and Trends" (November 2005). These data have been updated for 2008 with residential energy price projections contained in U.S. Department of Energy, Energy Information Administration, "Short-Term Energy Outlook," (June 2008).

Table VII-2
Household Energy Expenditures as a Percentage of Income, 2001

Income Category	Less than $10K	$10K-$30K	$30K-$50K	More than $50K	Totals
Households (thousands)[59]	9,800	28,900	23,600	47,000	109,300
Avg. Pre-Tax Income	$5,733	$19,707	$39,201	$107,649	$60,488
Est. After-Tax Income[60]	$5,532	$17,520	$32,380	$76,054	$47,396
Residential Energy Cost[61]	$1,039	$1,260	$1,456	$1,836	$1,493
Transportation Energy Cost[62]	$524	$888	$1,674	$1,694	$1,372
Total Energy Cost	$1,563	$2,148	$3,130	$3,530	$2,865
Energy Cost as % of Income	28.3%	12.3%	9.7%	4.6%	6.0%

Source: Various sources, as outlined in the footnotes.

Table VII-3
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: Various sources, as outlined in the footnotes.

[59] *2001 Survey of Residential Energy Consumption (RECS)*, op cit.
[60] U.S. Congressional Budget Office, *Effects of Gasoline Prices on Driving Behavior and Vehicle Markets*, January 2008.
[61] *Steven H. Wade, Price Responsiveness in the AEO2003 NEMS Residential and Commercial Buildings Sector Models,* Energy Information Administration, U.S. Department of Energy, 2008.
[62] "Short-Term Energy Outlook," op cit.

Table VII-4
Breakdown of Income Categories by Race (2008)[63]

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

Source: Various sources, as outlined in the footnotes.

VII.B. Effects on Low-Income Groups, the Elderly, African Americans, and Hispanics

VII.B.1. Impacts on Cost of Living and Poverty Rates

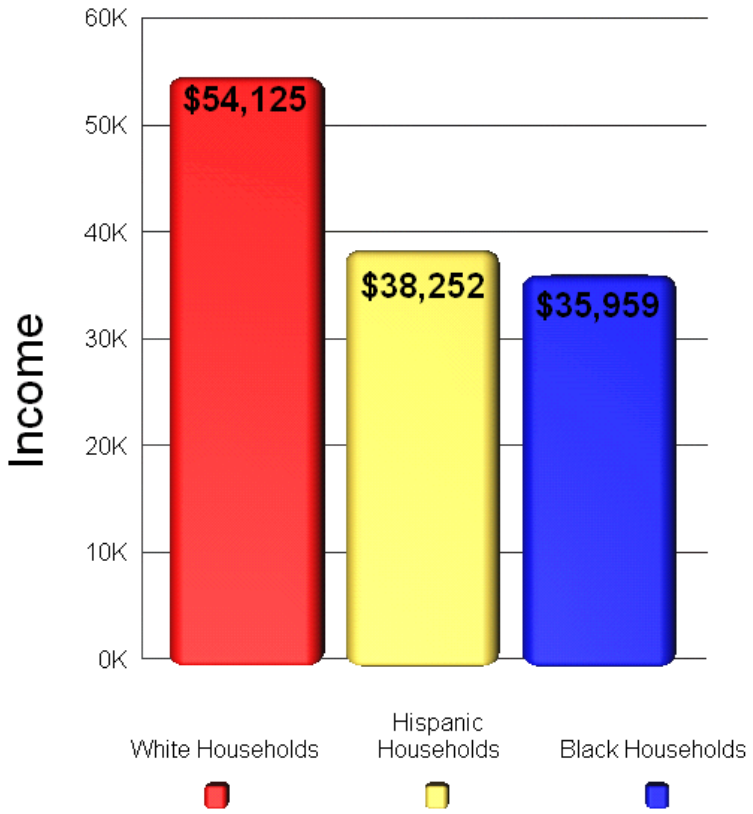
As discussed, one of the major effects of implementing the EPA CO_2 restrictions will be to substantially increase the costs of energy and, especially, electricity. This will impact minorities disproportionately, both because they have lower incomes to begin with, but also because they have to spend proportionately more of their incomes on utilities and electricity. For example:

- Whites spend, on average, about six percent of their income on utilities, whereas African Americans spend ten percent and Hispanics spend seven percent.
- Whites spend, on average, about two percent of their income on electricity, whereas African Americans spend nearly four percent and Hispanics three percent.

As shown in Figure VII-2, 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.

[63] *2001 Survey of Residential Energy Consumption (RECS)*, op. cit.

Figure VII-2
Racial Income Disparities

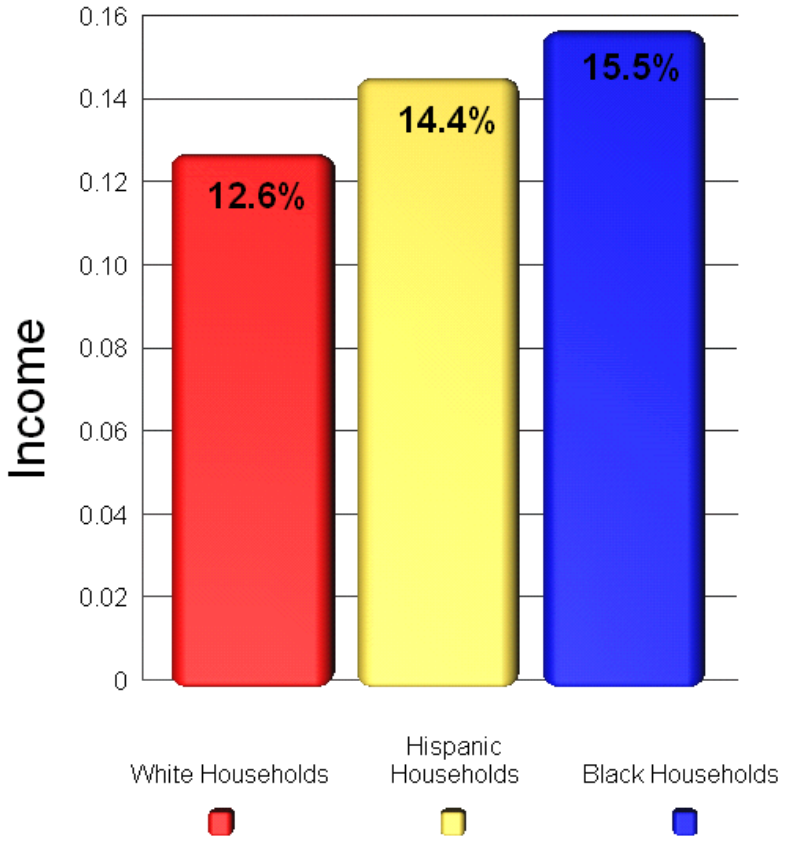


Source: U.S. Energy Information Administration, "Residential Energy Consumption Survey (2001)"

The implication of these data is that rising energy costs 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 VII-3 shows that, in the aggregate, 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.[64]

[64]Steven H. Wade, op. cit.

Figure VII-3
Energy Expenditures As a Percentage of After Tax Income



Source: U.S. Energy Information Administration, "Residential Energy Consumption Survey (2001)"

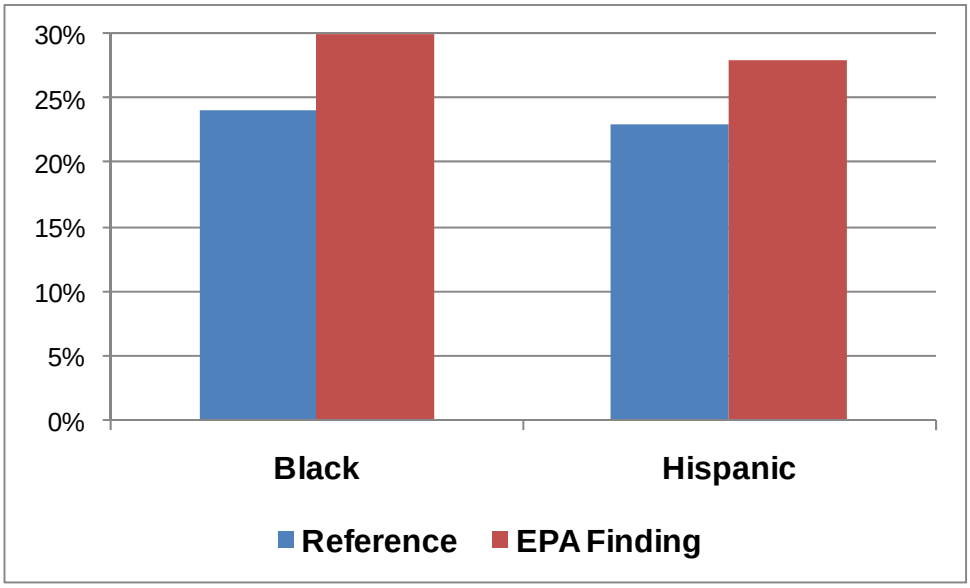
This disparity between racial groups means that rising energy costs have a disproportionately negative effect on the ability of minority families to acquire other necessities such as food, housing, childcare, or healthcare. Essentially, the EPA Finding will have the effect of a discriminatory tax based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

Black and Hispanic workers -- and their families – will likely be adversely affected threefold if the EPA Endangerment Finding is implemented: 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 much longer to find another job. As might be expected, these impacts on earnings and employment will increase the rates of poverty among African Americans and Hispanics.

The poverty rate for African Americans is slightly higher than that for Hispanics, the poverty rates for African Americans 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 VII-4, we estimate that one of the impacts of implementing the EPA Finding 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 African Americans from 24 percent to about 30 percent. This represents an increase in Black poverty of 20 percent.

Figure VII-4
Increases in 2025 Poverty Rates Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

This must be considered one of the more troubling potential impacts of the EPA Finding. While it is possible to debate specific estimates, timelines, and percentages, an unintended result of the EPA regulation will likely be to force millions of African Americans 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 African Americans 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 African Americans 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 African Americans 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 African Americans is 40 percent, and for Hispanics it is 45 percent.

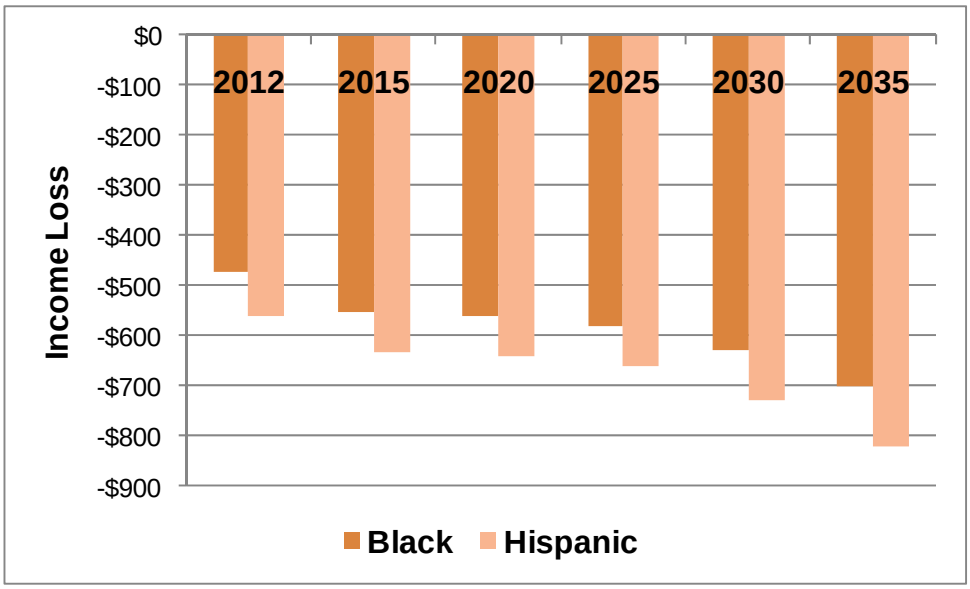
VII.B.2. Impacts on Incomes

Consumers and households will ultimately bear the added costs that will result from the EPA Endangerment Finding. The Finding 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 VII-5, implementation of the EPA Endangerment Finding 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 Finding is 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.
- The cumulative loss in Hispanic median household income over the period 2012 – 2035 will exceed $15,000.

Figure VII-5
Losses in Black and Hispanic Median Household Incomes Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

VII.B.3. Impacts on Jobs and Unemployment

If implemented, the EPA Endangerment Finding would divert resources currently used to produce goods and services into the task of obtaining energy from sources that are less energy efficient and more costly than fossil fuels. As consumers and businesses are forced to spend more on energy due to its higher costs, they have less to spend on other goods and services, thus causing decreases in demand for the quantities of goods and services produced by the economy. In addition, as the resources are diverted to more expensive energy sources, labor productivity will decrease. Business activity is likely to contract relative to the levels that would have prevailed without the EPA policy-induced energy cost increases. Demand for labor will weaken because employers need to spend less on labor in order to supply the reduced amount of goods and services demanded by consumers.

As a result, payments to labor will decline relative to that which would have prevailed without the higher energy costs. This will be reflected in a combination of reduced employment, and lower wages for those workers not losing their job.[65] The actual number of jobs that would be lost depends on whether higher-paying or lower-paying jobs are the ones that are eliminated. In our estimates, we assumed that jobs would be lost in equal proportions across the entire wage distribution, and estimated the

[65]Because these average losses in employment assume that workers absorb some of the reductions in equilibrium payments to labor, there is still some depression in the average salaries for those who retain their jobs.

loss in “average jobs.” The job estimates are inclusive of all increases in so-called “green jobs” that may be created as a result of the proposed EPA action.

It should be noted that the economic impact of the EPA Finding will not be a short-term phenomenon that consists of a few years of belt-tightening, after which the economy will be on a different (lower-carbon) track. Rather, getting to the lower-carbon future will require a long-term, sustained effort to continue increasing investments in more costly forms of energy, and this implies that for several decades payments to workers will remain lower than under the reference case that assumes no EPA CO_2 regulation.

The most salient characteristic of the employment status of the demographic groups is the fact that the unemployment rates for African Americans and Hispanics have consistently been much higher than average and than those for Whites:

- The unemployment rate for African Americans has historically been about twice that of Whites.
- The unemployment rate for Hispanics has been significantly higher than that for Whites, but lower than that for African Americans.
- Unemployment rates for African Americans and Hispanics tend to increase more during recessions, and decrease less during recoveries than do those for Whites.
- The duration of unemployment tends to be longer for African Americans and Hispanics than for Whites
- While different levels of educational attainment explain some of the differences in unemployment rates, they do not account for all of the differences.

African Americans 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, African Americans and Hispanics are disproportionately concentrated in jobs that pay the minimum wage or below.

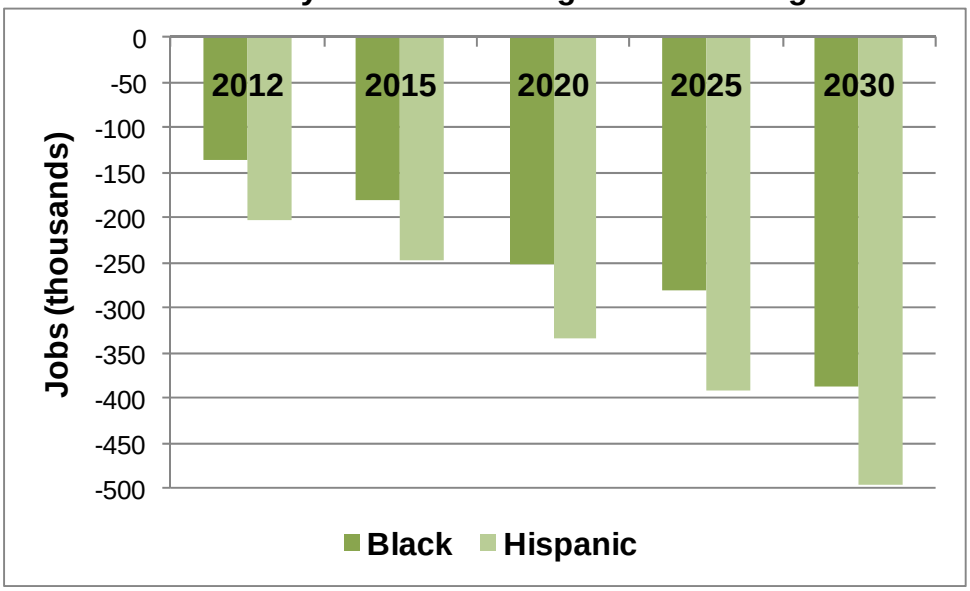
In addition to increased difficulty in paying home energy costs, sustained high energy prices could have an impact on the employment rate of low-wage workers. High energy prices cause businesses to cut costs by laying off workers. Experience has shown that those workers on the margin are usually the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

Figure VII-6 shows that, nationwide, implementation of the EPA Finding 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 VII-6
Black and Hispanic Job Losses
Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

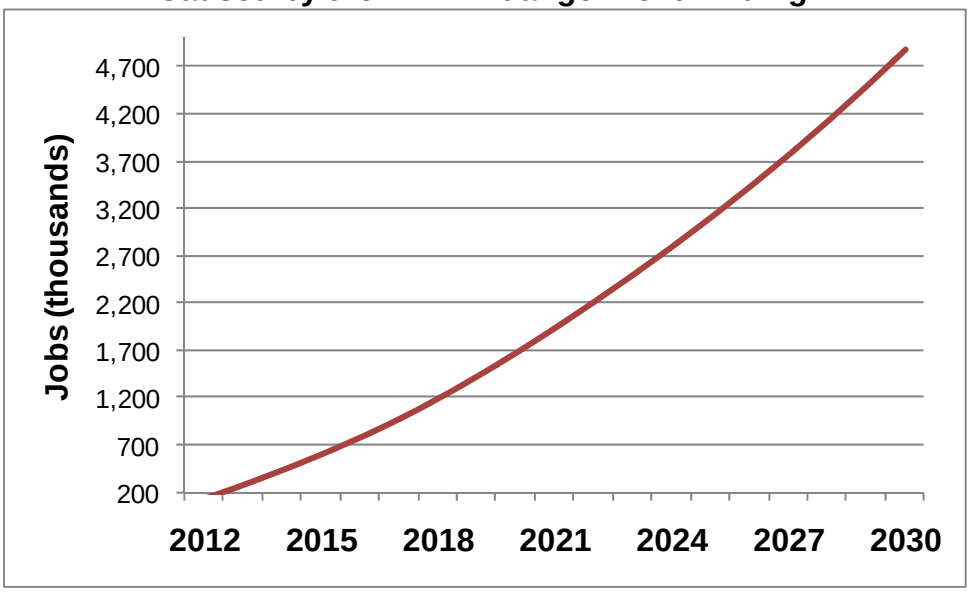
The job losses increase every year and the cumulative losses for African Americans and Hispanics will increase rapidly over the next two decades if the EPA regulation is enacted. As shown in Figure VII-7:

- By 2020, cumulative job losses for African Americans will total nearly 1.7 million.
- By 2030, cumulative job losses for African Americans will total about 4.9 million.

As shown in Figure VII-8:

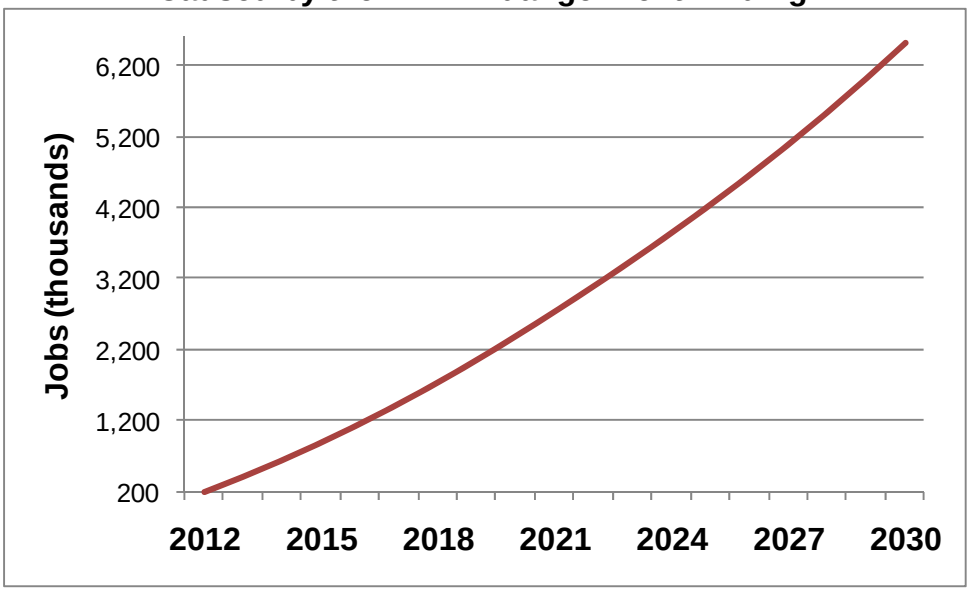
- By 2020, cumulative job losses for Hispanics will total 2.4 million.
- By 2030, cumulative job losses for Hispanics will total more than 6.5 million.

Figure VII-7
Cumulative Black Job Losses
Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

Figure VII-8
Cumulative Hispanic Job Losses
Caused by the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

VII.B.4. Impacts on Basic Expenditures and Discretionary Income

As discussed, African Americans 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 Finding 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 Finding will likely have a doubly negative impact on the living standards of African Americans and Hispanics:

- First, implementing the Finding will decrease Black and Hispanic incomes below where they would be in the absence of the regulation.
- Second, the Finding will increase the costs of the basic goods upon which African Americans and Hispanics must spend their reduced incomes.

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

- African Americans 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 Finding will likely exacerbate this situation by forcing African Americans 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 Finding 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 Finding will reduce the average discretionary incomes of both African Americans and Hispanics.

VII.B.5. Impacts of Higher Energy Burdens: Increased Energy Poverty

One of the more serious, but less recognized effects of implementing the EPA Finding will be to significantly increase the energy burdens for the elderly, African Americans, and Hispanics and increase the numbers of African Americans and Hispanics suffering from "energy poverty."

The EPA Finding 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 regulation 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.

Low-income households, in order to make ends meet, are forced to spend less on home energy than their higher-income counterparts.[66] For the low-income elderly who are particularly susceptible to weather-related illness such as potentially-fatal hypothermia, 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 Finding 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.

The price increases resulting from carbon restrictions would be highly regressive -- they would place a relatively greater burden on lower-income households than on higher-income ones. For example, one study 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, or 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, or 1.7 percent of their average income.[67]

[66]U.S. Congressional Budget Office, "Shifting the Cost Burden of a Carbon Cap-and-Trade Program," July 2003.
[67]Ibid.

It has been widely documented that, in addition to health risks, excessive energy burdens cause a variety of difficulties for low-income households.[68] Low-income households with high energy burdens are more likely than higher-income households to incur utility service disruptions because of an inability pay their bills. In turn, service disruptions represent major crises for affected customers, often threatening the customer's home. Studies have demonstrated a clear link between homelessness and utility terminations.[69]

The consequences of loss of heat in the winter include health and safety risks associated with alternative heat and lighting sources such as kerosene and candles, hunger and malnutrition, hypothermia, eviction, and increased homelessness and failure of children to thrive. In the summers, the dangers from loss of cooling are particularly acute for the elderly.

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.[70]

The high percentage of income paid by low-income households on home energy costs is more than just a statistical fact. That higher percentage translates into serious family and social problems. For example, several studies have demonstrated a strong connection between a family's inability to pay its home energy bills and some obvious- and not so obvious-consequences, including homelessness, malnutrition, heart disease, heat stroke, and the disintegration of families – including children removed from their homes because of loss of heat or electricity. Senior homeowners are forced to sell their homes because they cannot afford their energy bills. Further, children's educations are disrupted because their parents cannot pay the energy bills and are more likely to move frequently, changing schools and interrupting their children's educational development. Finally, "Inability to pay utilities is second only to inability to pay rent as a reason for homelessness."[71]

A major negative effect of promulgating the EPA regulation would be to significantly increase the energy burdens for African Americans and Hispanics and to

[68]See the discussion in American Gas Association, "The Increasing Burden of Energy Costs on Low-Income Consumers," September 2007; the National Consumer Law Center, "High Fuel Costs and Low-Income Families," October 2000; Meg Power, *The Cold Facts*, Citizen's Energy Corporation, 2003; and Meg Power, "Low-Income Consumers' Energy Bills and Energy Savings In 2003 and FY 2004," Economic Opportunity Studies, 2007.

[69]For example, a study conducted in the City of Philadelphia found a discernable relationship between utility termination and homelessness, and a study of homelessness in Northern Kentucky indicated that utility shutoffs were among the primary causes of homelessness in that region. Ibid.

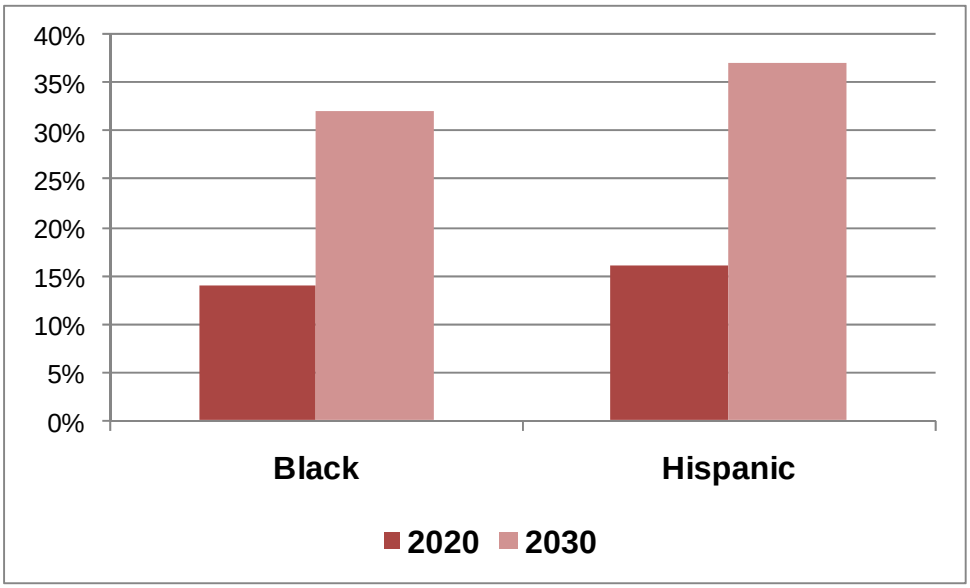
[70]Ibid.

[71]Ibid.

force large numbers of both groups into energy poverty. As shown in Figure VII-9, implementing the EPA Finding would:

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

Figure VII-9
Increases in Black and Hispanic Energy Burdens
Resulting From the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

VII.B.6. Impacts on Minority Small Businesses

Electricity costs and reliability are critical to low-income households and small businesses. Given the socioeconomic profile of many minority-based communities, the consequences of cost increases and extended electricity outages are severe,[72] and include:

- Loss revenue for small businesses, which may result in price increases for local consumers
- Lost wages due to an inability to get to work
- Job losses if small businesses are significantly affected
- Disruptions in mass transit

[72]Frank M. Stewart, "An Uneven Burden: Higher Prices/Less Reliability," American Association of African Americans in Energy, 2008.

- Health and mortality concerns
- Impacts on families if schools are closed

Small businesses will face the same higher costs for energy and other products as homeowners as a result of the EPA Finding, and the impact on Black and Hispanic small businesses will be especially severe. According to a 2008 National Federation of Independent Business survey, energy costs are the second biggest problem facing small business,[73] and the Endangerment Finding would exacerbate those concerns. Further, by damaging the overall economy, the Finding would make it more difficult for small businesses to operate. As discussed, we estimate that under this regulation GDP could decline by an average of $400 billion or more annually below where it would otherwise be from 2012 to 2035; cumulative GDP losses could total more than $10 trillion by 2035. This means that, if the EPA Endangerment Finding is implemented, in the coming decades small business owners will be operating in a weakened economy, making it even harder for them to attract customers, expand their business, and create jobs.

Black- and Hispanic-owned businesses represent a disproportionately small share of total businesses, tend to be smaller and less well capitalized than White-owned businesses, and are much more vulnerable to the economic dislocations likely to result from the EPA CO_2 restrictions. For example:

- Black businesses represent less than five percent of the total businesses in the U.S., and account for less than two percent of business receipts.
- Hispanic businesses represent less than seven percent of the total businesses in the U.S., and account for less than four percent of total business receipts.
- Receipts of the average Black business are only about one-fourth as large as the average business, and receipts of Hispanic businesses are less than half as large.
- The typical Black business has less than half as many employees as the average business, and the typical Hispanic business has only about one third as many employees.
- Although there are about 1.2 million Black-owned businesses in the U.S., only about 11,000 of them have annual revenues in excess of $1 million.
- Although there are 1.6 million Hispanic-owned businesses in the U.S., only about 29,000 of them have annual revenues in excess of $1 million.

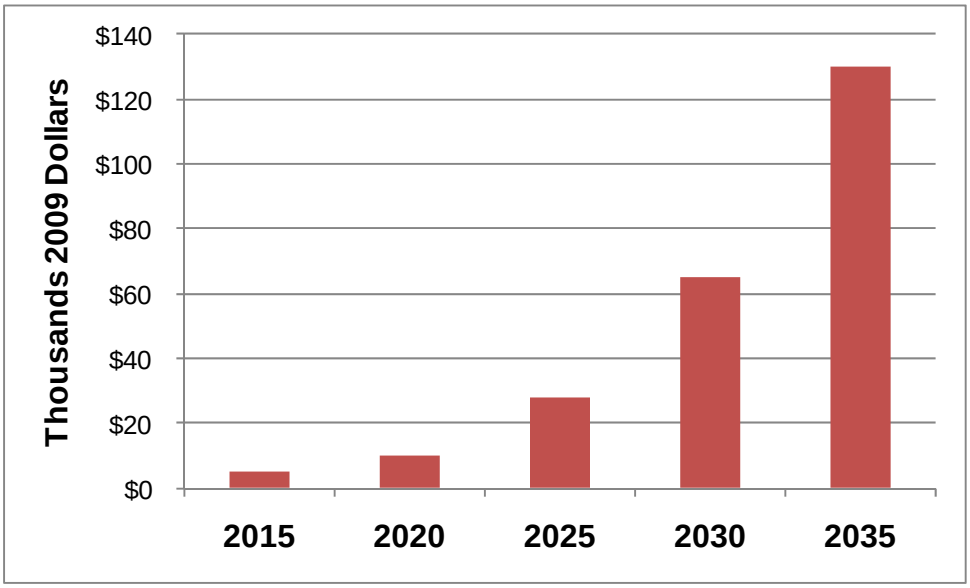
Thus, the potential impact of the EPA regulation on Black and Hispanic businesses is significant.

[73] Bruce Phillips and Holly Wade, "Small Business Problems and Priorities," National Federation of Independent Business Research Foundation, June 2008.

VII.B.7. Impacts on the Federal Debt Burden

As the economy adjusts to a reduced GDP and rising energy prices caused by the EPA Finding, economic activity declines, personal incomes decline, and employment decreases as millions of jobs are lost. The negative economic impacts accumulate, and the national debt will be affected. We estimate that the EPA regulation could increase the federal debt by nearly 30 percent by 2035 – over and above what it would be without the regulation (Figure VII-10).[74] This represents an additional $33,000 per person, or more than $130,000 for a family of four.[75] Since Black and Hispanic incomes are well below the U.S. average, the increased burden of this incremental debt would be 25 percent higher for Hispanic families and about 33 percent higher for Hispanic families.

Figure VII-10
Increased Federal Debt Burden For a Family of Four
Resulting From the EPA Endangerment Finding



Source: Heritage Foundation and Management Information Services, Inc., 2010.

[74]These estimates are based on the Heritage Foundation studies, op. cit.
[75]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.

VII.C. Impacts on African Americans and Hispanics by State

VII.C.1. Disparate Impacts on States

The previous discussion indicates that the impact of implementing the EPA Finding on the U.S. economy, and on low-income groups, African Americans, and Hispanics, will be severe. The regulation will cause higher energy costs to spread throughout the economy as producers try to cover their higher production costs by raising their product prices, and these impacts will be felt to varying degrees in different states. For example, because virtually all businesses rely on electricity to produce and sell goods and services, the economic impacts of coal-based energy extend far beyond the generation and sale of electricity. The availability of low-cost electricity produces powerful ripple effects that benefit state economies as a whole, but implementation of the EPA regulation would greatly increase electricity prices – and much more in some states than in others.

For example, consumers in the Midwest and Southeast will literally face double the impacts of carbon caps than consumers elsewhere in the country. Oak Ridge National Laboratory found that the carbon intensity of heating fuel and electricity generation will lead to very different cost increases in residential fuels. The Oak Ridge findings reveal dramatic variation in impacts across the regions by 2030, with vulnerable consumers in the South and Midwest incurring price increases more than double those of lower-income consumers in the Northeast and West.[76]

Since the proposed CO_2 restrictions would require continuing and increasingly severe reductions in the use of fossil energy to produce electricity in the states and cause large energy price increases, if the regulation is implemented all states will suffer substantial and increasingly severe economic and jobs impacts:

- Residents of all states will face increased costs for energy, utilities, and for other goods and services and will experience increased costs of living, beginning in 2012.
- Energy and electricity prices in each state would increase substantially, but to different degrees.
- The growth rates of state wages and incomes would be negatively affected over the next two decades, and by 2030 states' per capita personal incomes would be significantly lower than in the absence of the EPA regulation.
- Millions of jobs would be lost in the states, employment would be lower, and unemployment higher.
- Industries and firms will relocate among states, thus causing a further loss of jobs in many states.

[76]National Community Action Foundation, National Consumer Law Center, Public Citizen, and Friends of the Earth, "Statement on Consumer Impacts of a Cap-and-Trade Climate Change Policy," March 12, 2009.

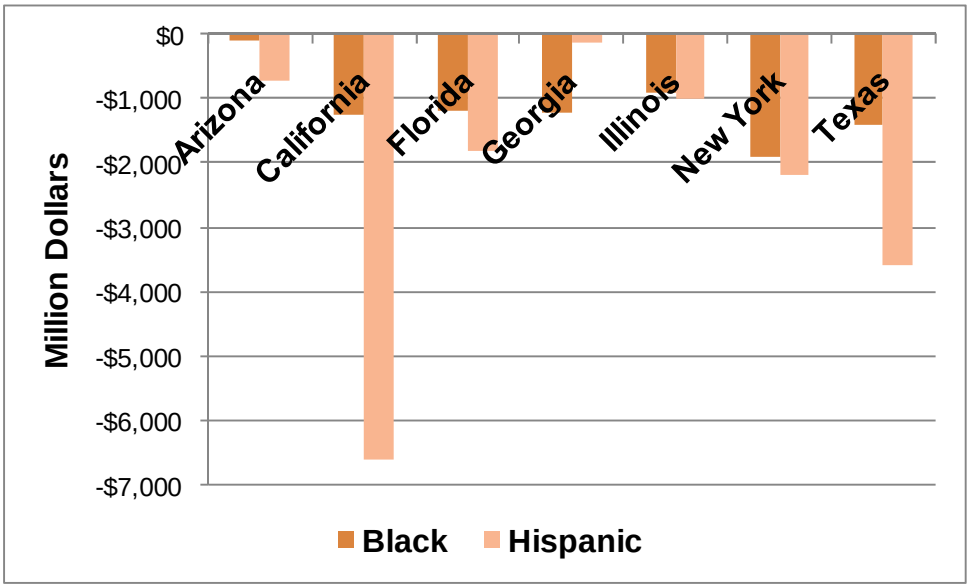
- New firms will hesitate to locate in some states, thus causing a reduction in the number of new jobs created.
- The combination of reduced economic activity in the states, decreased personal incomes for states' residents, and increased unemployment will strain state and local government budgets and result in reduced public services and increased taxes.

VII.C.2. Black and Hispanic Incomes

As part of this research we estimated the impacts of the EPA finding on African Americans and Hispanics in the seven states where they are the most heavily concentrated: Arizona, California, Florida, Georgia, Illinois, New York, and Texas. Figure VII-11 shows the average annual impacts in these states, 2012-2035, of the EPA endangerment finding on Black and Hispanic personal incomes. This figure illustrates that, in all states (except Georgia), the impacts on Hispanic incomes exceed the impacts on Black incomes, since there are more Hispanics than African Americans residing in these states. Further, the growth rates of the Hispanic population exceed those of African Americans in all of these states.

This figure also shows that the impacts vary widely among the states. The greatest loss of income will be experienced by Hispanics in California, since this state has, by far, the largest number of Hispanic residents and the most rapidly growing Hispanic population.

Figure VII-11
Average Annual Impact in Selected States, 2012-2035, of the EPA Endangerment Finding on Black and Hispanic Personal Incomes



Source: Management Information Services, Inc., 2010.

VII.C.3. Black and Hispanic Jobs

Figure VII-12 shows the average annual impacts in the seven states, 2012-2035, of the EPA endangerment finding on Black and Hispanic jobs. The jobs concept here is annual, full time equivalent jobs.[77] This figure illustrates that, in all states (except for Georgia), Hispanic job losses exceed Black job losses, since there are more Hispanics than African Americans residing in these states. Further, the growth rates of the Hispanic population exceed those of African Americans in all of these states.

This figure also shows that the impacts vary widely among the states. The greatest job losses will be experienced by Hispanics in California, since this state has, by far, the largest number of Hispanic residents. Nevertheless, the job losses are substantial in every state. For example, every year 2012 – 2035, average Hispanic job losses will total:

- Nearly 70,000 in California
- Nearly 40,000 in Texas
- Nearly 20,000 in Florida
- Nearly 13,000 in New York

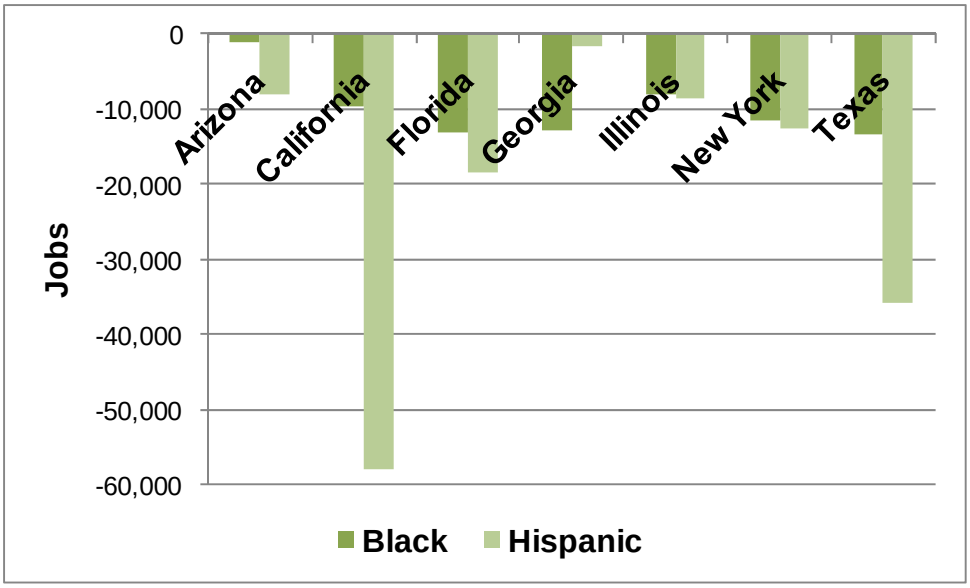
Every year 2012 – 2035, average Black job losses will total:

- More than 13,000 in Texas
- More than 13,000 in Florida
- Nearly 13,000 in Georgia
- Nearly 12,000 in New York

While Hispanic jobs losses exceed Black job losses in all of the states except Georgia, in some states job losses for the two groups are about the same – for example, in New York and in Illinois.

[77] An FTE job is defined as 2,080 hours worked in a year's time, and adjusts for part time and seasonal employment and for labor turnover. Thus, two workers each working six months of the year would be counted as one FTE job.

Figure VII-12
Average Annual Impact in Selected States, 2012-2035, of the EPA Endangerment Finding on Black and Hispanic Jobs



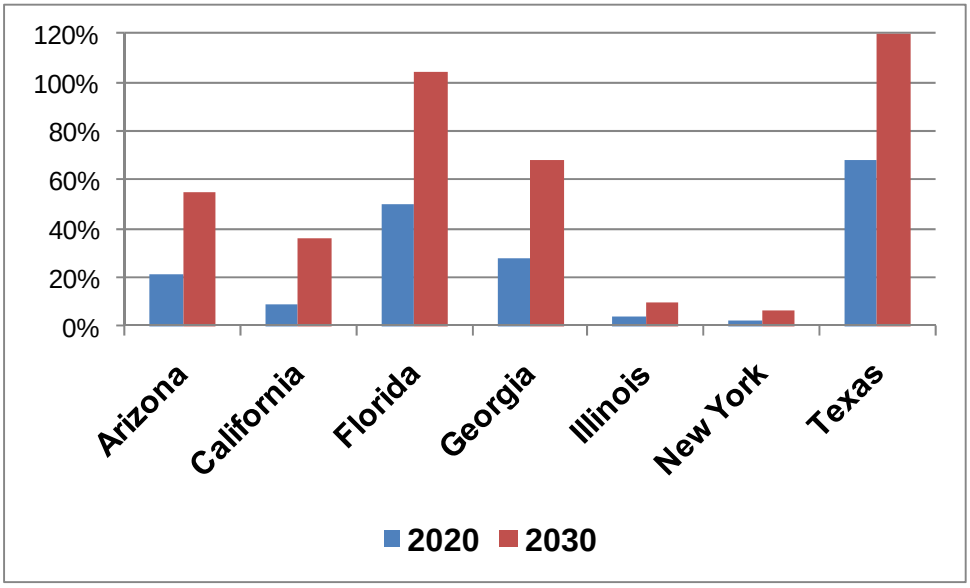
Source: Management Information Services, Inc., 2010.

VII.C.4. Black and Hispanic Energy Burdens

Figures VII-13 and VII-14 show the increases in Hispanic and Black energy burdens in the states in 2020 and 2030 resulting from the EPA Endangerment Finding. These figures illustrate that:

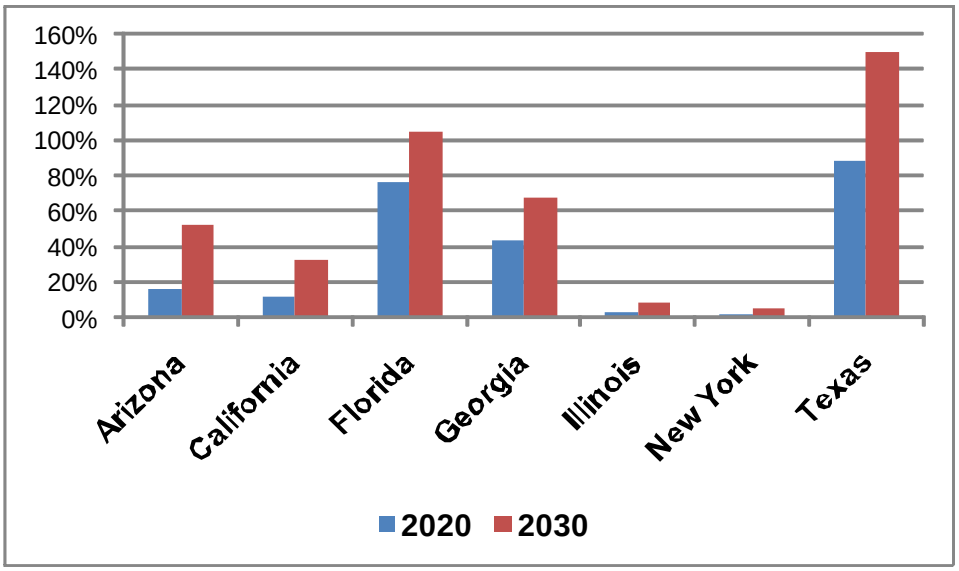
- The energy burdens for both African Americans and Hispanics increase in each year.
- For each group, the increases in energy burdens in 2030 are much larger than those in 2020.
- For each group, the increases in energy burdens are the largest in Texas, Florida, Georgia, and Arizona.
- In some states, such as Florida, Georgia, and Texas, the increased energy burden is larger for African Americans than for Hispanics
- In some other states, such as Arizona, California, and Illinois, the increased energy burden is larger for Hispanics than for African Americans

Figure VII-13
Increase in Hispanic Energy Burdens in Selected States
Resulting From the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

Figure VII-14
Increase in Black Energy Burdens in Selected States
Resulting From the EPA Endangerment Finding



Source: Management Information Services, Inc., 2010.

VIII. FINDINGS AND IMPLICATIONS

Our major finding is that the CO_2 restrictions implied in the EPA Endangerment Finding would have serious economic, employment, and energy market impacts at the national level and for all states, and that the impacts on low-income groups, the elderly, African Americans, and Hispanics would be especially severe. On the basis of studies of the economic impact of carbon restrictions, we estimated that implementation of the EPA Finding 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 carbon restrictions would significantly greatly U.S. energy costs, and by 2030 these increases (above the reference case) could total:

- 50 percent for gasoline prices
- 50 percent for 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 prices
- 40 percent for diesel prices
- 600 percent for electric utility coal prices

The EPA regulation 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 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.

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 Finding will have the effect of a discriminatory tax based on race.

Impact on Poverty

Black and Hispanic workers -- and their families – will likely be adversely affected threefold if the EPA Endangerment Finding is implemented: 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 much longer to find another job. These impacts on earnings and employment will increase the rates of poverty among African Americans and Hispanics, and we estimate that one of the impacts of implementing the EPA Finding 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 African Americans from 24 percent to about 30 percent. This represents an increase in Black poverty of 20 percent

This must be considered one of the more troubling potential impacts of the EPA Finding. An unintended result of the EPA regulation will likely be to force millions of African Americans and Hispanics below the poverty line -- many of whom have only recently managed to work their way out of poverty.

In addition, the EPA CO_2 restrictions, by increasing the costs of energy and energy-intensive building materials, will tend to increase the costs of housing. This will seriously affect African Americans 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 African Americans 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 African Americans is 40 percent, and for Hispanics it is 45 percent.

Impact on Incomes

Consumers and households will ultimately bear the added costs that will result from the EPA Endangerment Finding, and implementation of the Finding 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 Finding is 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.

Impact on Jobs

If implemented, the EPA Endangerment Finding would divert resources currently used to produce goods and services into the task of obtaining energy from sources that are less energy efficient and more costly than fossil fuels. Business activity is likely to contract relative to the levels that would have prevailed without the EPA policy-induced energy cost increases, demand for labor will weaken, and jobs will be lost.

The most salient characteristic of the employment status of the demographic groups is the fact that the unemployment rates for African Americans and Hispanics have consistently been much higher than average and than those for Whites. African Americans 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 Finding 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.

The job losses increase every year, and the cumulative losses for African Americans and Hispanics will increase rapidly over the next two decades if the EPA regulation is enacted:

- By 2020, cumulative job losses for African Americans will total nearly 1.7 million.
- By 2030, cumulative job losses for African Americans will total about 4.9 million.
- 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.

Impact on Basic Expenditures and Discretionary Income

African Americans 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 Finding 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 Finding will likely have a doubly negative impact on the living standards of African Americans and Hispanics:

- First, implementing the Finding will decrease Black and Hispanic incomes below where they would be in the absence of the regulation.
- Second, the Finding will increase the costs of the basic goods upon which African Americans and Hispanics must spend their reduced incomes.

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

- African Americans 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 Finding will exacerbate this situation by forcing African Americans 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 Finding 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 Finding will reduce the average discretionary incomes of both African Americans and Hispanics.

Increased Energy Poverty

One of the more serious, but less recognized effects of implementing the EPA Finding will be to significantly increase the energy burdens for the elderly, African Americans, and Hispanics and increase the numbers of African Americans and Hispanics suffering from "energy poverty." The Finding 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, 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 regulation 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.

For the low-income elderly who are particularly susceptible to weather-related illness such as hypothermia, 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 Finding 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. The price increases resulting from carbon restrictions would be highly regressive -- they would place a relatively greater burden on lower-income households than on higher-income ones.

It has been widely documented that, in addition to health risks, excessive energy burdens cause a variety of difficulties for low-income households. Further, "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 regulation would be to significantly increase the energy burdens for African Americans and Hispanics and to force large numbers of both groups into energy poverty. Implementing the EPA Finding would:

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

Impact on Minority Small Businesses

Electricity costs and reliability are critical to low-income households and small businesses. Given the socioeconomic profile of many minority-based communities, the

consequences of cost increases and extended electricity outages are severe. Small businesses will face higher costs for energy and other products as a result of the EPA Finding, and the impact on Black and Hispanic small businesses will be especially severe. Black- and Hispanic-owned businesses represent a disproportionately small share of total businesses, tend to be smaller and less well capitalized than White-owned businesses, and are much more vulnerable to the economic dislocations likely to result from the EPA CO_2 restrictions. Thus, the potential impact of the EPA regulation on Black and Hispanic Businesses is significant.

Impacts on the Federal Debt Burden

As the economy adjusts to a reduced GDP and rising energy prices caused by the EPA Finding, economic activity declines, personal incomes decline, and employment decreases as millions of jobs are lost. The negative economic impacts accumulate, and the national debt will be affected. We estimate that the EPA regulation could increase the federal debt by nearly 30 percent by 2035 – over and above what it would be without the regulation. This represents an additional $33,000 per person, or more than $130,000 for a family of four. Since Black and Hispanic incomes are well below the U.S. average, the increased burden of this incremental debt would be 25 percent higher for Hispanic families and about 33 percent higher for Hispanic families.

Impacts on African Americans and Hispanics by State

The impact of implementing the EPA Finding on the U.S. economy, and on low-income groups, African Americans, and Hispanics, will be severe. The regulation will cause higher energy costs to spread throughout the economy as producers try to cover their higher production costs by raising their product prices, and these impacts will be felt to varying degrees in different states. For example, because virtually all businesses rely on electricity to produce and sell goods and services, the economic impacts of coal-based energy extend far beyond the generation and sale of electricity. The availability of low-cost electricity produces powerful ripple effects that benefit state economies as a whole, but implementation of the EPA regulation would greatly increase electricity prices – and much more in some states than in others. For example, consumers in the Midwest and Southeast will literally face double the impacts of carbon caps than consumers elsewhere in the country.

Since the proposed CO_2 restrictions would require continuing and increasingly severe reductions in the use of fossil energy to produce electricity in the states and cause large energy price increases, if the regulation is implemented all states will suffer substantial and increasingly severe economic and jobs impacts:

- Residents of all states will face increased costs for energy, utilities, and for other goods and services and will experience increased costs of living, beginning in 2012.
- Energy and electricity prices in each state would increase substantially, but to different degrees.

- The growth rates of state wages and incomes would be negatively affected over the next two decades, and by 2030 state per capita personal incomes would be significantly lower than in the absence of the EPA regulation.
- Millions of jobs would be lost in the states, employment would be lower, and unemployment higher.
- Industries and firms will relocate among states, thus causing a further loss of jobs in many states.
- New firms will hesitate to locate in some states, thus causing a reduction in the number of new jobs created.
- The combination of reduced economic activity in the states, decreased personal incomes for states' residents, and increased unemployment will strain state and local government budgets and result in reduced public services and increased taxes.

We estimated the impacts of the EPA Finding on African Americans and Hispanics in the seven states where they are the most heavily concentrated: Arizona, California, Florida, Georgia, Illinois, New York, and Texas. In all states (except Georgia), the impacts on Hispanic incomes exceed the impacts on Black incomes, since there are more Hispanics than African Americans residing in these states. Further, the growth rates of the Hispanic population exceed those of African Americans in all of these states.

The impacts vary widely among the states. The greatest loss of income will be experienced by Hispanics in California, since this state has, by far, the largest number of Hispanic residents and the most rapidly growing Hispanic population. In all states (except for Georgia), Hispanic job losses exceed Black job losses. The impacts vary widely among the states. While Hispanic jobs losses exceed Black job losses in all of the states except Georgia, in some states job losses for the two groups are about the same – for example, in New York and in Illinois.

We estimated the increases in Hispanic and Black energy burdens in the states in 2020 and 2030 resulting from the EPA Endangerment Finding and found that:

- The energy burdens for both African Americans and Hispanics increase in each year.
- For each group, the increases in energy burdens in 2030 are much larger than those in 2020.
- For each group, the increases in energy burdens are the largest in Texas, Florida, Georgia, and Arizona.
- In some states, such as Florida, Georgia, and Texas, the increased energy burden is larger for African Americans than for Hispanics.
- In some other states, such as Arizona, California, and Illinois, the increased energy burden is larger for Hispanics than for African Americans.

Conservative Estimates

The results derived here should be viewed as conservative and as indicating the minimal negative effects that may be expected. The reason is that the CO_2 restriction programs and legislation that have been analyzed contain numerous subsidy, rebate, compensation, and incentive provisions to lessen the burden of the CO_2 restrictions – at least in the short run. The EPA Finding contains no such provisions, and EPA is not permitted to consider economic impacts in developing regulations. Thus, the impacts of the EPA Finding on the economy and labor market are likely to be even more severe than those estimated here.

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