ALLOWANCE ALLOCATION POLICIES IN CLIMATE LEGISLATION: ASSISTING CONSUMERS, INVESTING IN A CLEAN ENERGY FUTURE, AND ADAPTING TO CLIMATE CHANGE

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

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SUBMITTED MATERIAL

ALLOWANCE ALLOCATION POLICIES IN CLIMATE LEGISLATION: ASSISTING CONSUMERS, INVESTING IN A CLEAN ENERGY FUTURE, AND ADAPTING TO CLIMATE CHANGE

TUESDAY, JUNE 9, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:45 a.m., in Room 2322 of the Rayburn House Office Building, Hon. Edward Markey [chairman of the subcommittee] presiding.

Members present: Representatives Markey, Inslee, Butterfield, Melancon, McNerney, Dingell, Boucher, Pallone, Green, Baldwin, Ross, Matheson, Barrow, Waxman (ex officio), Upton, Hall, Stearns, Whitfield, Shimkus, Shadegg, Blunt, Pitts, Walden, Scalise, Terry and Barton (ex officio).

Staff present: Matt Weiner, Legislative Clerk; Lorie Schmidt, Senior Counsel; Melissa Bez, Professional Staff; Michael Goo, Counsel; Ben Hengst, Senior Policy Analyst, Mitch Smiley, Special Assistant; Lindsay Vidal, Press Assistant; Matt Eisenberg, Staff Assistant; Greg Dotson, Chief Counsel, Energy and Environment; Andrea Spring, Minority Professional Staff; Amanda Mertens Campbell, Minority Counsel; Aaron Cutler, Minority Counsel; Mary Neumayr, Minority Counsel; and Garrett Golding, Minority Legislative Analyst.

OPENING STATEMENT OF HON. EDWARD J. MARKEY, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF MASSACHUSETTS

Mr. MARKEY. Good morning to all of you, and this hearing will come to order.

Today's hearing will examine the ways in which allowance values from the Waxman-Markey clean energy bill can be used to assist consumers invest in a new energy future and help the United States and the world to adapt to climate change. Although that is a tall order for any piece of legislation, the Waxman-Markey bill, which was reported from the committee on May 21, 2009, does just that. The bill contains comprehensive energy legislation that will repower America with new clean energy sources, provide for increased energy independence, create new clean energy jobs, make investments in renewable energy sources, enhance competitiveness, strengthen our national security and fight global warming. This bill

achieves those goals but does so in a way that will help, not hurt, consumers, and that actually reduces the budget deficit.

In the more than 30 years that I have been in Congress, one word has always come first in every piece of legislation that I have worked on: consumers. From telecommunications to the environment to fuel economy standards, I have found that starting with the goal of saving families money is always the best organizing principle for an effective public policy. That is why the Waxman-Markey bill sends such a very high percentage of its allowance value directly to consumers. Under the legislation, more than 55 percent of the allowance value goes directly to consumers. Between 2012 and 2025, 32 percent goes to regulated electricity local distribution companies for the benefit of consumers. Six point five percent goes to natural gas local distribution companies for the benefit of consumers. One point six percent goes to States for the benefit of home heating oil and propane consumers. Fifteen percent goes to low- and moderate-income consumers.

In addition, the bill allocates 19 percent of allowance value to protect trade-exposed industries to help them maintain international competitiveness and to keep manufacturing jobs here in the United States. The bill also provides 6 percent of allowance value to States for investments in clean energy and energy efficiency. These programs will also help save money for consumers, enhance our energy independence and create good clean energy jobs in renewable energy and energy efficiency that cannot be outsourced.

And finally, the bill allocates 2.5 percent of allowance value for domestic adaptation including for public health. This allocation of allowance will assist consumers faced with increasing costs from a multitude of effects due to global warming. So if you add it all up between 2012 and 2025, more than 80 percent of allowance values will go towards programs that will, one, directly benefit consumers; two, lower costs for consumers; three, mitigate the effects of climate change for consumers; and four, keep or create jobs in the United States.

The rest of the value will also go to important public purposes. Between 2012 and 2025, 2 percent is dedicated to investments in electric vehicles and other advanced automobile technology that will strengthen our energy independence. Three point three percent is dedicated to carbon capture and sequestration technologies and 1.5 percent will go to research and development in clean energy and energy efficiency technologies. These investments also will create new jobs and help keep America more competitive. Other uses of allowance allocation in the legislation includes allocating 5 percent for supplemental reductions to be achieved by preventing topical deforestation and distributing 2.5 percent for international adaptation and clean energy transfer. These allocations will ensure that the United States will be well positioned to negotiate with other nations in the global climate treaty process. That in turn will also help protect our workers and consumers from foreign competition and from runaway costs due to unchecked global warming.

And finally, the bill dedicates a portion to the important goal of deficit reduction. On Friday, the Congressional Budget Office announced in its cost impact analysis that the Waxman-Markey bill

would reduce budget deficits or increase future surpluses by about $24 billion over the 2010–2019 period. Consequently, this bill is both environmentally responsible and fiscally responsible.

Our current reality is that America's economy is in a slump and consumers remain vulnerable to price spikes brought about by the old energy economy and an addiction to expensive foreign oil, but I have faith in our economy and that it will mend itself and once again become fully dominant if we make the right choices and unleash innovation now. The choice that we opt for now is to invest in clean energy jobs to improve our national security and provide a safe and healthy future for our economy. We thank all of you for participating in today's hearing.

[The hearing memorandum follows:]

MEMORANDUM

June 5, 2009

To: Members of the Subcommittee on Energy and Environment

Fr: Committee on Energy and Commerce Democratic Staff

Re: Hearing on "Allowance Allocation Policies in Climate Legislation: Assisting Consumers, Investing in a Clean Energy Future, and Adapting to Climate Change"

On Tuesday June 9, 2009, at 9:30 a.m. in room 2322 of the Rayburn House Office Building, the Subcommittee on Energy and Environment will hold a hearing to examine allocation policies under the American Clean Energy and Security Act (ACES).

I. BACKGROUND

On May 21, 2009, the Energy and Commerce Committee reported ACES by a vote of 33 to 25. The legislation is intended to create millions of new clean energy jobs, enhance America's energy independence, and protect the environment. It will achieve this result through a combination of measures including through the use of allowance value.

II. CLEAN ENERGY PROVISIONS

A. Renewable Electricity Standard

ACES requires retail electric suppliers to meet a growing percentage of their load with electricity generated from renewable resources and electricity savings. The combined renewable electricity and electricity savings requirement begins at 6% in 2012 and gradually rises to 20% in 2020. At least three quarters (75%) of the requirement must be met by renewable energy, except that upon receiving a petition from a governor, the Federal Energy Regulatory Commission may reduce this renewable requirement to three fifths (60%). By 2020, 15% of the electricity load in each state must be met with renewable electricity and 5% with electricity savings. Upon petition by a governor, the renewable requirement may be reduced to 12% and the electricity savings may be increased to 8%.

B. Investments in Clean Energy

ACES requires major sources of carbon emissions to obtain pollution permits called "allowances" for each ton of carbon dioxide or its equivalent they emit. Under the bill, through 2025, 13% of these allowances are allocated to investments in clean energy and energy efficiency.

EPA has estimated that the average allowance price in 2005 dollars will be $16 to $21 through 2025. At these allowance prices, ACES invests over $190 billion through 2025 in clean energy and energy efficiency programs, including $90 billion in state programs to promote renewable energy and energy efficiency; $60 billion in carbon capture and sequestration technologies; $20 billion in electric and other advanced technology vehicles; and $20 billion in basic research and development into clean energy and energy efficiency. The investments in carbon capture and sequestration include $10 billion generated through a small "wires charge" on electricity generated through fossil fuels.

Investments in clean energy continue after 2025, with 5% of allowances devoted to renewable energy and energy efficiency, 5% to carbon capture and sequestration, and 1.5% to research and development.

C. Supporting Private Investment in Clean Energy

ACES establishes a self-sustaining Clean Energy Deployment Administration to support private investments in clean energy technologies, including nuclear power. Other provisions promote private investment in clean energy by reforming the existing Title 17 loan guarantee program.

D. Modernizing the Electricity Grid

ACES includes provisions to promote deployment of smart grid technology and enhanced transmission planning.

III. ENERGY EFFICIENCY PROVISIONS

A. Building Standards

ACES establishes new standards for building efficiency, requiring new buildings to be 30% more efficient by 2012 and 50% more efficient by 2016. States are offered allowances that they can sell to support adoption and enforcement of the new standards. The Department of Energy must enforce the standards in states that do not incorporate the building standards into their state building codes.

B. Appliance Standards

ACES sets forth new efficiency standards for lighting products, commercial furnaces, and other appliances.

C. Vehicle Standards

The ACES discussion draft included provisions to harmonize federal fuel economy standards with EPA carbon emission standards and California's standards for light-duty vehicles. These provisions were dropped in the reported bill after the Administration reached an agreement on light-duty fuel economy standards with automakers and California. The reported bill retains requirements for EPA to promulgate carbon emission standards for heavy-duty vehicles and off-road vehicles, such as construction equipment, trains, and large ships. ACES also establishes a regional planning process to further reduce transportation-related energy consumption.

D. Other Efficiency Measures

ACES contains measures to increase the efficiency of water use and promote energy savings by the federal government and other public institutions.

IV. GLOBAL WARMING PROVISIONS

ACES contains three primary programs for reducing dangerous carbon emissions that cause global warming: (1) a cap on large domestic sources of emissions; (2) a program to reduce tropical deforestation; and (3) an offset program. ACES also caps emissions of global warming pollutants that are substitutes for ozone-depleting chemicals, and it requires EPA to set performance standards for some uncapped sources of emissions. Taken together, these programs are intended to reduce U.S. carbon emissions by 28% to 33% below 2005 levels by 2020. By 2050, these programs are intended to reduce U.S. carbon emissions by over 80% below 2005 levels.

A. Capping Carbon Emissions from Large Sources

Starting in 2012, ACES establishes annual tonnage limits on emissions of carbon and other global warming pollutants from large U.S. sources like electric utilities and oil refiners. Under these limits, carbon pollution from large sources must be reduced by 17% below 2005 levels by 2020 and 83% below 2005 levels by 2050. To achieve these goals, ACES establishes a system of tradable permits called "emission allowances" modeled after the successful Clean Air Act program to prevent acid rain. This market-based approach provides economic incentives for industry to reduce carbon emissions at the lowest cost to the economy.

B. Preventing Tropical Deforestation

ACES directs EPA and the State Department to use 5% of the allowances to secure agreements from developing nations to prevent tropical deforestation. This program is intended

to reduce U.S. carbon emissions by an additional 10 percentage points below 2005 levels by 2020.

C. Emission Offsets

ACES allows capped sources to increase their carbon emissions if they can obtain offsetting emission reductions from uncapped sources at a lower cost. ACES allows capped sources to use offsets to acquire up to 2 billion tons of emission credits annually. Half of these credits must come from domestic sources, except that if insufficient domestic offsets are available, up to 1.5 billion tons of emission credits may be obtained from international offset projects.

Starting in 2017, ACES requires capped sources to turn in five tons of international offsets to receive four tons of emission credits. This mechanism is intended to reduce U.S. carbon emissions by up to an additional five percentage points below 2005 levels by 2020.

ACES contains multiple provisions to ensure the integrity of offsets, including review by an independent scientific panel. Offsets may not be obtained from sources in a foreign nation until the United States has entered into an agreement with the originating nation establishing the terms of the offset program.

D. Cost-Containment Measures

ACES contains numerous cost-containment measures recommended by an industry-environmental coalition called the U.S. Climate Action Partnership (USCAP). These include unlimited banking, a two-year compliance period (which allows borrowing one year in advance), and a strategic reserve of allowances that are available for auction if allowance prices exceed 160% of their three-year average.

The proceeds of any sales from the reserve must be used to acquire additional international offsets, which is intended to replenish the reserve at a low cost and result in additional reductions in carbon emissions. In addition, ACES establishes a minimum floor price for auctioned allowances of $10 (in 2009 dollars) to provide stability and investment certainty.

E. Carbon Capture and Sequestration

ACES uses a combination of regulatory requirements and financial incentives to ensure that new coal-fired power plants will operate with carbon capture and sequestration (CCS) technology. All new coal plants permitted after 2020 must use CCS when they commence operations. Coal plants permitted between 2015 and 2020 lose eligibility for federal financial assistance if they do not use CCS when they commence operations; if they do not use CCS when they commence operations, they must retrofit CCS by no later than 2025 without federal financial assistance. Coal plants permitted between 2009 and 2015 lose eligibility for federal financial assistance if they do not retrofit CCS within five years after commencing operations; if they do not retrofit CCS by this date, they must retrofit CCS by no later than 2025 without

federal financial assistance. The 2025 retrofit deadline is accelerated if four gigawatts of electricity generation is deployed with CCS before 2025; it may also be extended by EPA by up to 18 months on a case-by-case basis.

V. ALLOWANCE PROVISIONS

ACES requires major U.S. sources of emissions to obtain allowances for each ton of carbon or its equivalent emitted into the atmosphere. EPA estimates that in 2005 dollars, these allowances will cost $11 to $15 in 2012, $13 to $17 in 2015, $17 to $22 in 2020, and $22 to $28 in 2025. Using EPA's estimates, the total value of the allowances created under the legislation ranges from $60 billion in 2012 to $113 billion in 2025.

From 2012 through 2025, the bill requires 55% of the allowances to be used to protect consumers from energy price increases; 19% to assist trade-vulnerable and other industries make the transition to a clean energy economy; 13% to support investments in clean energy and energy efficiency; and 10% for domestic adaptation, worker assistance and training, prevention of deforestation, and international adaptation. The remaining 3% of allowances are intended to help ensure that ACES is budget neutral.

From 2026 through 2050, the bill requires up to 58% of the allowances to be used to protect consumers; 19% for domestic adaptation, worker assistance and training, prevention of deforestation, and international adaptation; 12% to support investments in clean energy and energy efficiency; 7% to ensure budget neutrality; and at least 4% to assist trade-vulnerable and other industries.

A. Consumer Protection

ACES establishes five programs to protect consumers from potential energy price increases, including three programs to address electricity, natural gas, and heating oil prices, as well as a program to assist low- and moderate-income families and a program to provide tax dividends to consumers. Although EPA estimated that the global warming provisions in the ACES discussion draft would cost the average household $98 to $140 per year, less than a postage stamp per day, EPA has concluded that changes to ACES made in Committee will further reduce the costs of the legislation.

Electricity price increases are likely to be regional in nature, with the greatest increases occurring in the coal-dependent regions of the country. To mitigate these price increases, the regulated utilities that distribute electricity to consumers will receive 32% of allowances through 2025 under a formula that distributes half of the allowances based on emissions and half based on electricity generation. These utilities are directed to use these allowances exclusively to keep rates low and, to the extent they use rebates, to do so to the maximum extent practicable by reducing the fixed-rate portion of consumer electricity bills.

To mitigate increases in natural gas prices, the regulated utilities that distribute natural gas to consumers will receive 9% of allowances 2016 through 2025. One-third of these

allowances must be used for energy efficiency programs. The remainder must be passed on to consumers through lower prices under provisions similar to those that apply to the regulated electric utilities.

To mitigate increases in home heating oil prices, states will receive 1.6% of allowances under a formula based on home heating oil use. These allowances must be used for rebates to consumers and investments in energy efficiency.

In addition, ACES directs that 15% of the allowances be auctioned and the proceeds distributed back to consumers through a combination of refundable tax credits and electronic benefit payments. The Center for Budget and Policy Priorities estimates that these provisions will fully protect the bottom quintile of families and part of the next quintile from any direct or indirect energy price increases.

Under ACES, many of the allowance provisions phase out starting in 2026. As these allowance allocations are phased out, ACES directs that the remaining allowances he auctioned and the proceeds distributed to consumers through tax credits.

B. Protection of Trade-Vulnerable and Other Industries

Pursuant to the Inslee-Doyle program, energy-intensive, trade-exposed industries that make products like iron, steel, cement, and paper will receive allowances to cover their increased costs. The number of allowances set aside for this program will equal 15% of the allowances in 2014 and then decrease based on the percent reductions in the carbon emissions cap. These allowances will phase out after 2025 unless the President decides the program is still needed. In addition, oil refiners will receive 2% of allowances starting in 2014 and ending in 2026, and merchant coal producers and electricity producers obligated to supply electricity under long-term contracts will receive 5% of allowances through 2025.

C. Investments in Clean Energy and Energy Efficiency

States will receive 10% of allowances from 2012 through 2015; 7% of allowances in 2016 and 2017; 6% of allowances from 2018 through 2021; and 5% of allowances thereafter for investments in renewable energy and energy efficiency. Two percent of allowances from 2014 through 2017 and 5% of allowances thereafter will be available to electric utilities to cover the costs of installing and operating carbon capture and sequestration technologies. Three percent of allowances from 2012 through 2017 and 1% of allowances from 2018 through 2025 will be available for investments in electric vehicles and other advanced automobile technology and deployment. One-and-a-half percent of allowances in each year will be allocated to support research and development in advanced clean energy and energy efficiency technologies.

D. Domestic Adaptation

From 2012 through 2021, 2% of allowances will be allocated to prepare the United States to adapt to the impacts of climate change. The amount of allowances allocated for domestic

adaptation will increase to 4% from 2022 through 2026 and to 8% thereafter. Half of these allowances will be used for wildlife and natural resource protection and half for other domestic adaptation purposes, including public health.

E. Preventing Tropical Deforestation and International Adaptation

From 2012 through 2025, 5% of allowances will be allocated to prevent tropical deforestation and build capacity to generate international deforestation offsets. The allowances allocated to this program will be reduced to 3% from 2026 through 2030 and to 2% thereafter. From 2012 through 2021, 2% of allowances will be allocated for international adaptation and clean technology transfer. The amount of allowances allocated for these purposes will increase to 4% from 2022 through 2026 and to 8% thereafter. Half of these allowances will be used for adaptation and half for clean technology transfer.

F. Worker Assistance and Job Training

From 2012 through 2021, 0.5% of allowances will be allocated for worker assistance and job training. This amount will increase to 1% thereafter.

VI. WITNESSES

The following witnesses have been invited to testify:

Mr. Thomas F. Farrell II
Chairman, President and CEO
Dominion
(on behalf of the Edison Electric Institute)

Mr. Rich Wells
Vice President, Energy
Dow Chemical Company

Mr. Nat Keohane
Economist
Environmental Defense Fund

Reverend Dr. Mari Castellanos
Minister for Policy Advocacy
United Church of Christ, Justice and Peace Ministries

Mr. G. Tommy Hodges
Chairman
Titan Transfer, Inc
(on behalf of the American Trucking Associations)

Mr. David Sokol
Chairman of the Board
Mid American Energy Holdings Company

Mr. David Montgomery
Vice President
Charles River Associates

Staff Contacts: Michael Goo or Joel Beauvais at (202) 225-4407.

June 2, 2009

American Energy and Security Act (H.R. 2454)

Committee on Energy and Commerce

On May 21, 2009, the Energy and Commerce Committee reported the American Clean Energy and Security Act by a vote of 33 to 25. The legislation will create millions of new clean energy jobs, enhance America's energy independence, and protect the environment.

Key provisions in the bill:

- Require electric utilities to meet 20% of their electricity demand through renewable energy sources and energy efficiency by 2020.
- Invest in new clean energy technologies and energy efficiency, including energy efficiency and renewable energy ($90 billion in new investments by 2025), carbon capture and sequestration ($60 billion), electric and other advanced technology vehicles ($20 billion), and basic scientific research and development ($20 billion).
- Mandate new energy-saving standards for buildings, appliances, and industry.
- Reduce carbon emissions from major U.S. sources by 17% by 2020 and over 80% by 2050 compared to 2005 levels. Complementary measures in the legislation, such as investments in preventing tropical deforestation, will achieve significant additional reductions in carbon emissions.
- Protect consumers from energy price increases. According to estimates from the Environmental Protection Agency, the reductions in carbon pollution required by the legislation will cost American families less than a postage stamp per day.

Because of its balanced approach, the American Clean Energy and Security Act has received broad support from industry and environmentalists. During Committee consideration, the legislation was backed by a coalition that included electric utilities, oil companies, car companies, chemical companies, major manufacturers, environmental organizations, and labor organizations, among many others.

Clean Energy Provisions

Renewable Electricity Standard. The American Clean Energy and Security Act (ACES) requires retail electric suppliers to meet a growing percentage of their load with electricity generated from renewable resources and electricity savings. The combined renewable electricity and electricity savings requirement begins at 6% in 2012 and gradually rises to 20% in 2020. At least three quarters (75%) of the requirement must be met by renewable energy, except that upon receiving a petition from the governor, the Federal Energy Regulatory Commission can reduce the renewable requirement to three fifths (60%). In 2020, 15% of the electricity load in each state must be met with renewable electricity and 5% with electricity savings. Upon petition by the governor, the renewable requirement can be reduced to 12% and the electricity savings can be increased to 8%.

Investments in Clean Energy. ACES requires major sources of carbon emissions to obtain a pollution permit called an "allowance" for each ton of carbon dioxide or its equivalent that they emit. Through 2025, 13% of these allowances are allocated to investments in clean energy and energy efficiency. EPA has estimated that the average allowance price in 2005 dollars will be $16 to $21 through 2025. At these allowance prices, ACES invests over $190 billion through 2025 in clean energy and energy efficiency programs, including: $90 billion in state programs to promote renewable energy and energy efficiency; $60 billion in carbon capture and sequestration technologies; $20 billion in electric and other advanced technology vehicles; and $20 billion in basic research and development into clean energy and energy efficiency. The investments in carbon capture and sequestration include $10 billion generated through a small "wires charge" on electricity generated through fossil fuels.

Investments in clean energy continue after 2025, with 5% of allowances being devoted to renewable energy and energy efficiency, 5% to carbon capture and sequestration, and 1.5% to research and development.

Supporting Private Investment in Clean Energy. ACES establishes a self-sustaining Clean Energy Deployment Administration to support private investments in clean energy technologies, including nuclear power. Other provisions promote private investment in clean energy by reforming the existing Title 17 loan guarantee program.

Modernizing the Electricity Grid. ACES includes provisions to promote deployment of smart grid technology and enhanced transmission planning.

Energy Efficiency Provisions

Building Standards. ACES establishes new standards for building efficiency, requiring new buildings be 30% more efficient in 2012 and 50% more efficient in 2016. States are offered allowances that they can sell to support adoption and enforcement of the new standards. The Department of Energy must enforce the standards in states that do not incorporate the building standards into their state building codes.

Appliance Standards. ACES mandates new efficiency standards for lighting products, commercial furnaces, and other appliances.

Vehicle Standards. The ACES discussion draft included provisions to harmonize federal fuel economy standards with EPA carbon emission standards and California's standards for light-duty vehicles. These provisions were dropped in the reported bill after the Administration reached an agreement on light-duty fuel economy standards with the automakers and California. The reported bill retains requirements for EPA to promulgate carbon emission standards for heavy-duty vehicles and off-road vehicles, such as construction equipment, trains, and large ships. ACES also establishes a regional planning process to further reduce transportation-related energy consumption.

Other Efficiency Measures. ACES contains measures to increase the efficiency of water use and promote energy savings by the federal government and other public institutions.

Global Warming Provisions

ACES contains three primary programs for reducing dangerous carbon emissions that cause global warming: (1) a cap on large domestic sources of emissions; (2) a program to reduce tropical deforestation; and (3) an offset program. In addition, ACES caps emissions of global warming pollutants that are substitutes for ozone-depleting chemicals, and it requires EPA to set performance standards for some uncapped sources of emissions. Taken together, these programs will reduce U.S. carbon emissions by 28% to 33% below 2005 levels by 2020. By 2050, ACES will reduce U.S. carbon emissions by over 80% below 2005 levels through these programs.

Capping Carbon Emissions from Large Sources. Starting in 2012, ACES establishes annual tonnage limits on emissions of carbon and other global warming pollutants from large U.S. sources like electric utilities and oil refiners. Under these limits, carbon pollution from large sources must be reduced by 17% below 2005 levels by 2020 and 83% below 2005 levels by 2050. To achieve these limits, ACES establishes a system of tradable permits called "emission allowances" modeled after the successful Clean Air Act program to prevent acid rain. This market-based approach provides economic incentives for industry to reduce carbon emissions at the lowest cost to the economy.

Preventing Tropical Deforestation. ACES directs EPA and the State Department to use 5% of the allowances to secure agreements from developing nations to prevent tropical deforestation. This program will reduce U.S. carbon emissions by an additional 10 percentage points below 2005 levels by 2020.

Emission Offsets. ACES allows capped sources to increase their carbon emissions if they can obtain offsetting emission reductions from uncapped sources at a lower cost. The legislation allows capped sources to use offsets to acquire up to 2 billion tons of emission credits annually. Half of these credits must come from domestic sources, except that if insufficient domestic offsets are available, up to 1.5 billion tons of emission credits can be obtained from international offset projects. Starting in 2017, ACES requires capped sources to turn in five tons of international offsets to receive four tons of emission credits. This mechanism will reduce U.S. carbon emissions by up to an additional five percentage points below 2005 levels by 2020.

ACES contains multiple provisions to ensure the integrity of offsets, including review by an independent scientific panel. Offsets may not be obtained from sources in a foreign nation until the United States has entered into an agreement with the originating nation establishing the terms of the offset program.

Cost-Containment Measures. ACES contains numerous cost-containment measures recommended by an industry-environmental coalition called the U.S. Climate Action Partnership (USCAP). These include unlimited banking, a two-year compliance period (which allows borrowing one year in advance), and a strategic reserve of allowances that are available for auction if allowance prices exceed 160% of their three-year average. The proceeds of any sales from the reserve will be used to acquire additional international offsets, which will replenish the reserve at a low cost and result in additional reductions in carbon emissions. In addition, ACES establishes a minimum floor price for auctioned allowances of $10 (in 2009 dollars) to provide stability and investment certainty.

Carbon Capture and Sequestration. ACES uses a combination of regulatory requirements and financial incentives to ensure that new coal-fired power plants will operate with carbon capture and sequestration (CCS) technology. All new coal plants permitted after 2020 must use CCS when they

commence operations. Coal plants permitted between 2015 and 2020 lose eligibility for federal financial assistance if they do not use CCS when they commence operations; if they do not use CCS when they commence operations, they must retrofit CCS by no later than 2025 without federal financial assistance. Coal plants permitted between 2009 and 2015 lose eligibility for federal financial assistance if they do not retrofit CCS within five years after commencing operations; if they do not retrofit CCS by this date, they must retrofit CCS by no later than 2025 without federal financial assistance. The 2025 retrofit deadline is accelerated if four gigawatts of electricity generation is deployed with CCS before 2025; it may also be extended by EPA by up to 18 months on a case-by-case basis.

Allowance Provisions

ACES requires that major U.S. sources of emissions obtain an allowance for each ton of carbon or its equivalent emitted into the atmosphere. EPA estimates that in 2005 dollars, these allowances will cost $11 to $15 in 2012, $13 to $17 in 2015, $17 to $22 in 2020, and $22 to $28 in 2025. Using EPA's estimates of allowance prices, the total value of the allowances created under the legislation ranges from $60 billion in 2012 to $113 billion in 2025.

For the period from 2012 through 2025, 55% of the allowances will be used to protect consumers from energy price increases; 19% will be used to assist trade-vulnerable and other industries make the transition to a clean energy economy; 13% will be used to support investments in clean energy and energy efficiency; and 10% will be used for domestic adaptation, worker assistance and training, prevention of deforestation, and international adaptation. The remainder (3 % of allowances) will be used to help ensure that ACES is budget neutral.

From the period from 2026 through 2050, up to 58% of the allowances will be used to protect consumers: 19% will be used for domestic adaptation, worker assistance and training, prevention of deforestation, ar. international adaptation; 12% will be used to support investments in clean energy and energy efficiency; 7% will be used to ensure budget neutrality; and at least 4% will be used to assist trade-vulnerable and other industries.

Protection of Consumers. ACES establishes five programs to protect consumers from energy price increases: one for electricity price increases; one for natural gas price increases; one for heating oil price increases; one to protect low- and moderate-income families; and one to provide tax dividends to consumers. In combination, these programs substantially reduce the impact of ACES on American consumers. EPA estimated that the global warming provisions in the ACES discussion draft would cost the average household $98 to $140 per year, less than a postage stamp per day. EPA has estimated that the changes to ACES made in Committee will further reduce the costs of the legislation.

Protection from Electricity Price Increases. Electricity price increases will be regional in nature, with the greatest increases occurring in the coal-dependent regions of the country. To mitigate these price increases, the regulated utilities that distribute electricity to consumers will receive 32% of allowances through 2025 under a formula that distributes half of the allowances based on emissions and half based on electricity generation. These utilities are directed to use these allowances exclusively to keep rates low and, to the extent they use rebates, to do so to the maximum extent practicable by reducing the fixed-rate portion of consumer electricity bills.

Protection from Natural Gas Price Increases. To mitigate increases in natural gas prices, the regulated utilities that distribute natural gas to consumers will receive 9% of allowances 2016 through 2025. One-third of these allowances must be used for energy efficiency programs. The remainder must be passed through to consumers through lower prices under provisions similar to those that apply to the regulated electric utilities.

Protection from Heating Oil Price Increases. To mitigate increases in home heating oil prices, states will receive 1.6% of allowances under a formula based on home heating oil use. These allowances must be used for rebates to consumers and investments in energy efficiency.

Protection of Low- and Moderate Income Families. The electricity, natural gas, and heating oil provisions mitigate the costs of ACES on all consumers. In addition, ACES directs that 15% of the allowances be auctioned and the proceeds distributed back to consumers through a combination of refundable tax credits and electronic benefit payments. The Center for Budget and Policy Priorities estimates that these provisions will fully protect the bottom quintile of families and part of the next quintile from any direct or indirect energy price increases.

Consumer Climate Dividend. Under ACES, many of the allowance provisions phase out starting in 2026. As these allowance allocations are phased out, ACES directs that the remaining allowances be auctioned and the proceeds distributed to consumers through tax credits.

Protection of Trade-Vulnerable and Other Industries. Pursuant to the Inslee-Doyle program, energy-intensive, trade-exposed industries that make products like iron, steel, cement, and paper will receive allowances to cover their increased costs. The number of allowances set aside for this program will equal 15% of the allowances in 2014 and then decrease based on the percent reductions in the carbon emissions cap. These allowances will phase out after 2025 unless the President decides the program is still needed.

In addition, oil refiners will receive 2% of allowances starting in 2014 and ending in 2026, and merchant coal producers and electricity producers obligated to supply electricity under long-term contracts will receive 5% of allowances through 2025.

Investments in Clean Energy and Energy Efficiency. States will receive 10% of allowances from 2012 through 2015; 7% of allowances in 2016 and 2017; 6% of allowances from 2018 through 2021; and 5% of allowances thereafter for investments in renewable energy and energy efficiency. Two percent of allowances from 2014 through 2017 and 5% of allowances thereafter will be available to electric utilities to cover the costs of installing and operating carbon capture and sequestration technologies. Three percent of allowances from 2012 through 2017 and 1% of allowances from 2018 through 2025 will be available for investments in electric vehicles and other advanced automobile technology and deployment. One-and-a-half percent of allowances in each year will be allocated to support research and development in advanced clean energy and energy efficiency technologies.

Domestic Adaptation. From 2012 through 2021, 2% of allowances will be allocated to prepare the United States to adapt to the impacts of climate change. The amount of allowances allocated for domestic adaptation will increase to 4% from 2022 through 2026 and to 8% thereafter. Half of these allowances will be used for wildlife and natural resource protection and half for other domestic adaptation purposes, including public health.

Preventing Tropical Deforestation and International Adaptation. From 2012 through 2025, 5% of allowances will be allocated to prevent tropical deforestation and build capacity to generate international deforestation offsets. The allowances allocated to this program will be reduced to 3% from 2026 through 2030 and to 2% thereafter. From 2012 through 2021, 2% of allowances will be allocated for international adaptation and clean technology transfer. The amount of allowances allocated for these purposes will increase to 4% from 2022 through 2026 and to 8% thereafter. Half of these allowances will be used for adaptation and half for clean technology transfer.

Worker Assistance and Job Training. From 2012 through 2021, 0.5% of allowances will be allocated for worker assistance and job training. This amount will increase to 1% thereafter.

Mr. MARKEY. Now let me turn and recognize the gentleman from Michigan, the ranking member of the subcommittee, Mr. Upton.

Mr. UPTON. Well, thank you, Mr. Chairman. I have a prepared statement that I am going to ask to put into the record, and——

Mr. MARKEY. Without objection, it will be so ordered.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. I came back from Michigan and was in the office yesterday when I heard about the CBO report, which I have not read yet but I am getting a copy and I look forward to reading it in the next day or two.

John Dingell, in a subcommittee hearing that we had, I believe it was last month or it might have been the end of April, called cap and trade a great big tax, and man, was he right. When you look at what different publications say, CBO puts hefty price tag on emissions plan, this cap-and-trade system is seen to cost $846 billion. It goes on to say in the story, American Petroleum Institute president Jack Girard said the projected costs of the emission allowance will mean increases as much as 70 cents a gallon for gasoline with diesel fuel going up as much as 88 cents per gallon. The Brookings Institute, not exactly a center right organization, called cap and trade to reduce carbon dioxide emissions would lower the Nation's gross domestic product in 2050 by 2½ percent. It goes on to say that about 35 percent of crude oil-related jobs and 40 percent of coal-related jobs will be lost in 2025, according to the analysis, and it shows that the personal consumption would fall by as much as .5 percent or $2 trillion by 2050. It goes on to conclude that they think that the government would raise about $1.5 trillion by 2020 if it sold all the carbon emissions, so almost double what CBO said.

During the Memorial Day break, I visited one of my small companies that have been around for 100-some years in Niles, Michigan, Niles Steel Tank. Now, that is what they make, custom-made steel tanks. These are 750-gallon tanks. They know about cap and trade. In fact, they said that if cap and trade was enacted, they were thinking about canceling the day shift and moving all of their production into the nighttime so that they could take advantage of lower energy costs because they were worried about what those costs would do, knowing that they today pay about $11,000 a month in electricity and about $9,000 in natural gas. The testimony that we are going to hear from Mr. Sokol as it relates to refineries, he indicates on page 5 that India is building a one-million-barrel-per-day refinery to make transportation fuels that will be exported almost exclusively to the U.S. and European markets. This refinery, larger than any refinery in the United States, is equal to the total capacity of about 15 of Lion Oils. Under this bill, the Indian refinery, which already operates at a significant cost advantage, will not be required to purchase allowances for CO_2 emitted from its plant.

Mr. Chairman, we are, particularly those of us in the Midwest, we are going through some very hard times. The news relating to the auto industry and other manufacturing sectors, our unemployment rate has been double digits for more than a year, and many

of our counties, they are predicting perhaps as high as 20 percent by the end of the summer and even higher then. This cap-and-trade bill, as John Engler said, could put us into a permanent recession, those of us that are facing this in the Midwest, and I look forward to the hearing and I yield back my time.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the chairman emeritus of the committee, the gentleman from Michigan, Mr. Dingell.

OPENING STATEMENT OF HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. DINGELL. Mr. Chairman, thank you for holding this hearing. It is important that our constituents understand the steps the Energy and Commerce Committee has taken to protect consumers, protect trade and vulnerable industries, to invest in clean technologies and help vulnerable segments of the population and our natural environment to adapt to climate change. One day of trying to craft a sensible approach to deal with climate change, a time several years ago, I have been clear in my belief that it is not going to be cheap and that most likely consumers will be seeing substantially increased energy costs. Moreover, I have been extremely concerned that enacting an economy-wide cap-and-trade program could adversely affect our already struggling manufacturing sector.

I have to say, I am impressed with the approach taken in H.R. 2454 in terms of allocating and the allowance values to address these concerns. H.R. 2454 establishes five programs to protect consumers from potential energy price increases. EPA has estimated that global warming provisions in the discussion draft would cost the average household $98 to $140 per year, and they have concluded that the changes made in the committee draft will further the costs of the legislation.

Now, being from the Midwest, where we are extremely dependent on coal for our electricity, I have to believe that our people are particularly susceptible to electricity price increases. I am pleased with the approach adopted by the committee. Regulated utilities that distribute electricity to consumers will receive allowances that must be used to keep prices low. Giving the allowances to regulated utilities should cut down on opportunities for rascality. However, this is something on which we must be diligent in watching when this or similar legislation is signed into law.

I am also pleased with the portion of allowance values going to the auto industry for investment in green vehicles. Specifically, the majority would go into the Department of Energy section 136, advanced technology vehicles manufacturing program, with a portion going to plug-in electric vehicle manufacturing and deployment. We have seen remarkable innovations from automakers as consumers have begun to show interest in more-fuel-efficient vehicles and the allowance values will spur more innovations and new green job creation at job.

Finally, Mr. Chairman, I am pleased with the allowance values allocated to natural resource adaptation. As I have said on numerous occasions, I consider this to be a moral imperative and I am pleased that the chairman agrees with my perspective. I look for-

ward to hearing from our witnesses today for their perspectives on the allocation scheme as laid out in H.R. 2454. Thank you, Mr. Chairman.

Mr. MARKEY. We thank the gentleman. The Chair recognizes the ranking member of the full committee, Mr. Barton.

OPENING STATEMENT OF HON. JOE BARTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BARTON. Thank you, Mr. Chairman. First, let me thank you and Chairman Waxman for agreeing to this hearing. I had asked that we hold two hearings. You all have agreed to at least this one and maybe another one. Even though the markup has already occurred, I think it is important to try to get into the mechanics and to understand the intricacies of the allocation and the cap-and-trade allowances part of this legislation, so I do appreciate you and Chairman Waxman for agreeing to this hearing. I want to thank our witnesses. I know many of you have spent many sleepless nights trying to understand this system and hopefully you can help explain it to the people who are actually trying to put it into place.

We have a fundamental disagreement on the basic premise of this bill. The proponents of the bill are fervent and I think sincere in their belief that manmade CO_2 is a dominant contributor to what is either called global warming or climate change. Most of the opponents of the bill, and I certainly put myself in that camp, think climate change is an issue that we need to study and we need to address but we are not convinced that mankind generically and CO_2 specifically is a dominant cause of the climate changing. So we start with the fundamental disagreement on the basic premise of the bill, but if you get beyond that and you get beyond the science, you next come to a couple of inescapable facts. Number one is, you can't have it both ways. If manmade CO_2 in the United States really is a problem, then you don't give the allowances away. You either have a carbon tax, which would be the most efficient and straight-up transparent way to deal with the problem, or you do 100 percent auction for CO_2 allowances. Well, we put 100 percent auction allowance on the table in the markup. I think it got five votes of 50-some-odd votes. So if you are really not going to charge for that commodity, in this case, manmade CO_2, you are going to give a lot of it away, you are not going to reduce it. I listened to Mr. Markey's opening statement downstairs in my office on the television, and if I add it up correctly, in the beginning he is giving away around 85 percent of these allowances. So you are going to auction off 15 percent. You are not going to make a dent in CO_2 charging only 15 percent of the population that you regulate trying to control it. So that is a fundamental problem.

The second fundamental problem is, in spite of the best efforts, you can't make an allocation system in an economy as complex as the United States. You can't really make it fair. I don't doubt the sincerity of the proponents of the bill when they say they are trying to make sure that nobody pays more than their fair share, but just this local distribution company system where you get 50 percent of your allowances and it all goes to the local distribution company but 50 percent is based on the generating capacity and then 50 percent is based on emissions. Well, if you are in an area like the

Northwest where you have huge generating capacity but it is all hydro, you are getting a free gift. Now, if you are in an area like the Southeast where they don't really have a lot of wind power and they don't really have a lot of hydropower, you are going to have a health transfer where you pay for your allowances from the Southeast to the Northwest. Now, that may be what the proponents want but it is not fair and we need to address that. Then you start with these allowances for various industry groups. Refineries get 2 percent and I heard Mr. Markey say there is kind of a general set-aside of 1.6 percent for heating oil. When you start trying to interact those types of allowances with the generic electricity allowances, you are going to in some cases get double counting and in other cases get undercounting, and I don't see how you rectify that.

So, you know, my time is about to expire. The SO_2, when we did sulfur dioxide cap and trade in the 1990s, that is the model that everybody points to that we can make CO_2 work here in the early part of the 21st century. There is a big difference. SO_2 was almost totally manmade. SO_2 had discrete point sources that we knew where it was. SO_2, we had a technology to control it that was cost-effective. We have none of that. The bill says any point source in the United States that generates more than 25,000 tons a year is subject to regulation. Twenty-five thousand tons of CO_2 is not a lot of CO_2.

So Mr. Chairman, I appreciate you holding this hearing. We are really going to have a fine time, as Chairman Dingell would say, trying to understand the system and hopefully at the end of the hearing the American public will have a better understanding of it. Thank you and Mr. Waxman for holding this hearing.

Mr. MARKEY. We thank the gentleman very much. The Chair recognizes the chairman of the full committee, the gentleman from California, Mr. Waxman.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Thank you very much, Mr. Chairman. I appreciate this hearing.

The bill, H.R. 2454, requires major U.S. sources of emissions to obtain an allowance for each ton of global warming pollution emitted into the atmosphere, and the emission allowances provide a critically important tool in transitioning the country to a clean energy future. In deciding how to use the value of the allowances, the committee was guided by four principles. First, we wanted to assist consumers with the transition, and we use over 50 percent of the allowances for this purpose. We have five programs to protect consumers from electricity price increases, one for natural gas, one for heating oil, one to protect low- and moderate-income families and one to provide a tax dividend to consumers. In combination, these programs ensure that American consumers are protected as the legislation is implemented.

Secondly, the bill invests in developing and deploying energy efficiency programs and clean energy technology. This will be a driver of jobs and innovation and it will help us break the connection be-

tween energy generation and carbon emissions, allowing us to meet increasingly tighter emission limits at lower costs than are predicted today. This will also help the United States be a global leader in clean energy technologies.

Third, we worked hard to assist industry in making the transition to clean energy economy. We cannot afford to add significant uncompensated costs that would disadvantage manufacturing and production here compared to other countries that do not have emission limitations like China and India, and providing transition assistance to our industries helps ensure that the reductions in emissions occur because our industry is becoming more efficient, not because they are moving production and emissions overseas.

Finally, H.R. 2454 provides allowances for a number of other important purposes. It would provide assistance to help us adapt to climate change both here and abroad. The international adaptation piece rises to moral obligations and will help the president negotiation a strong treaty in Copenhagen. It will also help address some of the national security issues that Senator John Warner and others have warned us about, and the bill would also generate large additional low-cost emission reductions by reducing tropical deforestation, helping us to avoid dangerous climate change.

The committee has worked hard on this allocation plan to ensure that it is fair. It does what a good energy bill needs to do. It balances the interests of different parts of the country and of different stakeholders and accomplishes much of what it is important to everyone. It will go a long way to moving the country into a clean energy future.

I do want to point out, there has been some misunderstanding I have seen in some of the articles in the press. They say that when we give out a free allowance, we are not sending the right price signal to the consumers to make the reductions in use of energy. Well, I think that misunderstands the bill. We do have the limit, overall limit on carbon emissions so we have the incentives to make those reductions. We wanted to have those reductions made in the least costly way and the signals are sent to the people who are most able to make the reductions just as we have the requirements on the major sources of the pollution that we are trying to reduce. So I think that a lot of people think that there is only one way and that is to have a harsh burden on people to get the reductions. I think we can have a transition, reduce the carbon emissions and benefit everyone at the same time.

I yield back my time.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Kentucky, Mr. Whitfield, for 2 minutes.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. Thank you, Mr. Chairman.

When I heard you speaking of this bill, I was not sure we were talking about the same bill. I was reading recently an article signed by Peter Orszag, the current chairman of OMB, entitled "Tradeoffs in allocating allowances for CO_2 emissions." In that

study, he said very clearly a common misconception is that freely distributing allowances to purchasers would prevent consumer prices from rising as a result of the cap, and then he goes on to say higher consumer costs were borne out in the cap-and-trade programs for sulfur dioxide in the United States and also for CO_2 emissions in Europe. Consumer prices increased even though producers were given free allowances. He goes on to say in this report that those price increases would be regressive and that poorer households would bear a larger burden relative to their incomes than wealthier households would. He goes on to say that job losses in certain energy industries like coal, for example, would be severe; job losses would be severe.

So I am glad we are having this hearing because none of us really understand the way this is going to work and we certainly do not understand the way that consumers are going to be protected. The final comment that I would make, the Energy Information Agency came out with a report based on this bill and it very clearly shows that we are moving lower electricity costs from one area of the country to other areas of the country. The States that really get hurt by this bill are Alabama, Florida, Georgia, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, West Virginia and Wyoming, and there are some States on the East Coast and West Coast that will benefit from this bill.

I yield back. My time has expired.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Virginia, Mr. Boucher.

Mr. BOUCHER. I thank the chairman. I will waive opening statement and reserve time for questions.

Mr. MARKEY. The Chair recognizes the gentleman from California, Mr. McNerney.

OPENING STATEMENT OF HON. JERRY MCNERNEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. MCNERNEY. Thank you, Mr. Chairman. First of all, I want to thank the witnesses today for coming today. It is a broad spectrum of philosophies, and that is important for this discussion.

I am proud to support the Act. I think it is a good Act. It leads to environmental goals by capping carbon emissions and in the long run it will create jobs, a lot of jobs. You know, the allowance allocation is essential. It has been devised to protect both businesses and families and to increase America's efficiency, which is absolutely essential for us to meet our long-term goals of getting ahead of the price increases by being more and more efficient so that consumers pay less out of their pockets for the same result, or in fact for better results, so I think it is essential and I support it, and I am looking forward to the discussion. I think there will be some good ideas that come out here today.

So with that, I would yield back.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Illinois, Mr. Shimkus.

OPENING STATEMENT OF HON. JOHN SHIMKUS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. SHIMKUS. I am down here, Mr. Chairman. Thank you very much. I want to thank Joe Barton and Chairman Waxman for agreeing to this hearing. You know, I wish it would have been done prior to the markup but that is water under the bridge. We move on, and I am ready to move with you.

I was waiting for the great proclamation from the Chinese trip that they had China agree to an international standard to cap carbon trade. The chairman has been curiously silent on that issue. I am not shocked. What I have heard is that the Chinese want $140 billion a year from the United States to help them in their transition to cap carbon from the taxpayers. They won't sign a treaty claiming to be doing it on themselves and their claims actually result in a 30 percent for their carbon output. Does that sound like they are playing ball? I would say not.

I also want to make sure that if we have another hearing that we address this issue called compulsory licenses. For those of you who think that we are going to be making all this profit from green jobs and the green economy, guess what? We are going to sign an international agreement that forces the holder or the patent or a copyright to give away their exclusive rights to grant use to the States and to others. So all those companies that think they are going to sell and make a profit by having a patent, we are going to give it to China without compensation or for minimal compensation. That is a great plan and that is in this bill and it ought to be stripped out.

And I will just end on this article from Business Week, banks gearing up for carbon trading. Here is another wealth transfer to large, big banks, but while U.S. policymakers continue to squabble over the details of the cap-and-trade proposal, big banks—haven't we bailed them out enough—are gearing up for what they see as a new profit center. U.S. carbon trading is coming.

So if you want to help out the big banks and bail them out, move on this legislation. I yield back my time.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from North Carolina, Mr. Butterfield.

OPENING STATEMENT OF HON. G.K. BUTTERFIELD, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NORTH CAROLINA

Mr. BUTTERFIELD. Thank you very much, Mr. Chairman, for convening this hearing today and I certainly thank the witnesses for their participation. I look forward to this hearing because there is still a lot of questions that we need to have answered and perhaps some of your wisdom may be very helpful to us.

We have certainly had tremendous difficulty in devising an equitable way of making the allowance allocations. We spent a lot of time doing that. We finally reached a compromise and now we have it on paper. The allowance allocation in this Act accomplishes the difficult and necessary balance of assuring environmental integrity while easing the transition costs for the covered entities and thus easing the cost for consumers. And so yes, there will be free alloca-

tions. Criticism that the free allocation of credits in the early years of this program allows polluting companies off the hook could not be further from the truth. The overall cap ensures greenhouse gas emitters will reduce their emissions. This law forces electric utilities and petroleum refineries and steel companies and paper and chemical manufacturers to make investments, substantial investments in energy efficiency and cleaner fuels whether or not the credits or auctioned.

Throughout consideration of this issue, I have spoken repeatedly about the necessity to protect consumers from price hikes resulting from this legislation. The allocation accomplishes this by devoting resources to regulated LDCs whose bylaws require that they pass the value along to the consumers. Most importantly, the poorest Americans who contributed least to this problem and are least able to ensure any increases in cost are held harmless. I am satisfied of that. The 15 percent allowance value devoted to these struggling households guarantees recoupment of any lost purchasing power and does not phase out over the life of the program. This critical component is essential to a fair and balanced policy that achieves the long-term goal of reducing greenhouse gas emissions while keeping struggling consumers free from irreparable economic harm.

Again, Mr. Chairman, I support this legislation and thank the witnesses for coming. I yield back.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Pennsylvania, Mr. Pitts.

OPENING STATEMENT OF HON. JOSEPH R. PITTS, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF PENNSYLVANIA

Mr. PITTS. Thank you, Mr. Chairman, and thank you for holding this important hearing on the allocation policies under the American Clean Energy and Security Act.

Mr. Chairman, like all of us, I believe we should work to decrease the amount of greenhouse gas emissions in our atmosphere and we should be good stewards of this earth and it resources. However, I do not believe this bill, which passed out of this committee last month, will do anything to accomplish its goal of reducing global temperatures. Instead, I believe it will have a crippling effect on our economy for years to come without much environmental benefit. It will still irreparably damage our economy despite the allocation policies that are supposed to protect the consumer. No matter how it is doctored or tailored, it is a tax. It is a national energy tax that will hurt each and every household. It will destroy sectors of our economy and cause job losses at a unprecedented rate.

We should be protecting our environment through innovation, through entrepreneurship and cooperation and encouragement. This bill tries to cut carbon emissions through taxation and punishment, the heavy hand of big government and litigation. We should be creating jobs by encouraging entrepreneurship, competition, new technologies. Instead, this bill is going to cost countless working men and women their jobs. This bill as previously drafted in the original draft which had 50 pages on light bulbs and two sentences on nuclear power. Now, that has changed somewhat, but as ana-

lyzed a couple of weeks ago by the Public Utility Commission in Pennsylvania, it would have cost 66,000 jobs in Pennsylvania alone by 2020. Much of it is still applicable.

I urge my colleagues to consider just how irresponsible it is to continue to support legislation that will cost so many jobs and do so much damage to our economy just as we are struggling to come out of one of the worst recessions in recent history. The American people can see this and they will be angry. It punishes everyone in America who uses energy, that is, everyone in America. Instead, we should be crafting policies that create incentives to bring on line new nuclear power plants, hydrogen storage technology, more cost-effective wind and solar technology, smart grid technology, more efficient electricity transmission and other innovations. We don't need to wash trillions of dollars of American taxpayer money through the federal bureaucracy in order to get a clean energy economy. The alternative to job killing and big government cap-and-trade plans is to create incentives and let the market pick the winners.

I want to thank the witnesses for coming today. I look forward to hearing their testimony. I yield back.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Texas, Mr. Green.

OPENING STATEMENT OF HON. GENE GREEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. GREEN. Thank you, Mr. Chairman, for holding the hearing. I thank you and the Chair of the full committee for your leadership on the American Clean Energy and Security Act. The success is a testament to your ability to find consensus among our diverse membership. I applaud your efforts and look forward to continuing to work on refinements in that bill.

Today's hearing is yet another opportunity to learn more about how allowances are distributed under H.R. 2454. The top criticisms of any cap and trade are the projected impacts on the American consumer and our domestic industries. With our economy sluggish and family incomes already stretched, any policy must ensure that hardworking Americans do not see their energy costs skyrocket or U.S. jobs moved overseas. I believe that additional transitional assistance may be needed. H.R. 2454 struck a careful balance in allocating carbon allowances. The legislation devotes significant allocation to protect consumer energy price increases, electric, natural gas. LDCs receive 40 percent of the allowances, a value that must be passed on to the benefit of the consumers through lower electric and natural gas bills.

Second, the legislation provides allowances to keep U.S. industry competitive with foreign nations that do not have carbon reductions. I want to thank my friends Inslee and Doyle for their work on the 15 percent allocation. The 2 percent allocation for refiners is intended to keep them competitive and encourage energy efficiency improvement. Ultimately, I believe more assistance is needed and I know we will hear that today from our witness from the refineries.

I know Congressman Barton is here and he has questioned many times whether carbon human activity and knowing our ranking

member's love for Texas A & M, I just saw a recent study, Mr. Chairman, that was released from Reuters from Texas A & M showing the Texas coast, particularly Corpus Christi, faces widespread flooding and the most powerful hurricanes flooding and, quote, from the author of the study, "hurricanes will be more severe." Jennifer Irish, assistant professor of coastal and ocean engineering at Texas A & M, states, "The worse global warming gets, the more severe the consequences for the Texas coast."

Mr. Chairman, I have run out of my time but we surely don't want to see Padre and Mustang Islands, much less Galveston, Texas, have too high of tides. So I will be glad to forward this to you, Ranking Member.

Mr. BARTON. Not everything at Texas is as it seems on the surface.

Mr. GREEN. Thank you. I yield back my remaining time.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Oregon, Mr. Walden.

OPENING STATEMENT OF HON. GREG WALDEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Mr. WALDEN. Thank you very much, Mr. Chairman. I just want to make a couple of points. First of all, it has been said that there is enormous transfer to the Northwest as a result of cap and trade in this bill, and while there is a certain truth to that in some sectors, we are going to find out today that the 553,000 customers of Pacific Corps face a 17.9 percent increase in their power costs in the first year of this legislation in 2012. That is a $163 million hit to customers in Oregon, according to the data that we are going to hear, and so I think we have seen what happens when you have the government take over the auto sector. That is playing out in every rural town in America right now as dealers are getting shot in the head. This bill amounts to a government takeover of the energy sector and we are going to see how that plays out.

Meanwhile, the Chinese, you know—there is a story in the Washington Post today that quotes from a May 20th position paper regarding the Copenhagen meeting where the Chinese are expecting the developed countries to reduce their emissions by at least 40 percent from the 1990 level by 2020. This legislation reduces it by 4. So you see the level of expectation that the Chinese have for us. If that is the case and it is a 10-fold increase, then does that mean my ratepayers are going to see 179 percent increase in their energy costs?

Meanwhile, I know you would all be disappointed if I didn't point out that this legislation fails miserably in the area of woody biomass and in fact, two-thirds of the federal land would be off limits as a result. That has still not has been fixed in this legislation. I desperately hope it does because, as we know from the example in Sweden, you could actually create 30,000 jobs as they did using biomass and produce 18 percent of their electricity with woody biomass.

Finally, I would say this does amount, according to CBO, to an $846 billion increase in federal revenues, an $821 billion increase in direct spending, and while they initially say that is a surplus of $24 billion, they go on to point out that it would increase discre-

tionary spending by about $50 billion over the 2010 to 2019 period. So it does cost money, it raises taxes, it will hurt jobs and it raises rates to consumers.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Arkansas, Mr. Ross.

OPENING STATEMENT OF HON. MIKE ROSS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARKANSAS

Mr. ROSS. Thank you, Chairman Markey, for holding today's hearing on allowance allocation policies in climate change legislation. This is an important topic and I am pleased to see the subcommittee discussing this issue.

I would like to also thank all the witnesses that have come before the subcommittee to testify today. I want to particularly use my time to recognize one of the witnesses, Mr. Steve Cousins, with Lion Oil Company. Steve is the vice president of refining for Lion Oil Company, which is located in my Congressional district in El Dorado, Arkansas. Lion Oil has been a leading employer in El Dorado for over 85 years and their refinery in Ed Dorado produces approximately 70,000 barrels of gasoline and diesel fuel per day. Lion Oil employs about 1,200 direct employees in El Dorado, one of many towns across my district that has been hit hard by the recession, and they employ another 3,600 individuals that depend indirectly on the plant in El Dorado. As such, I am concerned about how the cap-and-trade legislation that the committee recently passed will affect Lion Oil and other small refineries across America, and I am eager to hear Mr. Cousins' testimony today on their behalf. I am particularly concerned that perhaps as a committee we picked winners and losers in the allocation process, and certainly I feel that the small refineries came out on the short end of the stick. As the leader of the free world, I believe that America must lead by example on climate change. However, we must embrace a commonsense approach to imposing regulations that will help to improve our environment while still maintaining jobs and strengthening our Nation's economy, and I am hopeful that Steve's testimony and others today will help us do that.

Once again, thank you for holding this hearing and I look forward to the testimony in order to work on a solution to climate change that is consistent with commonsense Arkansas values, one that does right by the environment and the economy. And with that, Mr. Chairman, I yield back.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Louisiana, Mr. Scalise.

OPENING STATEMENT OF HON. STEVE SCALISE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF LOUISIANA

Mr. SCALISE. Thank you, Mr. Chairman. This hearing on allowance allocation policies is long overdue and should have been held months ago.

The allocation section of the cap-and-trade energy tax bill that this committee marked up last month remained essentially empty until just hours before our committee met. This ill-advised cap-and-trade energy tax, which was the product of secretive backroom

deals and special-interest trading will hijack our entire American economy and will raise costs on all American families and businesses at a time when they can least afford it. The American people expect and deserve more, especially at a time when they were promised transparency. No one denies that the cap-and-trade energy tax will cause millions of American jobs to be shipped to foreign countries like China and India while American families will pay thousands more in increased utility costs. Even President Obama has acknowledged that his cap-and-trade energy tax will lead to higher electricity prices by stating, "Under my plan of a cap-and-trade system, electricity rates would necessarily skyrocket." And just last month the current CBO director, Douglas Elmendorf, testified before the Senate that a cap-and-trade program would lead to higher prices for energy-intensive goods.

This bill creates big winners and big losers. The big losers are American families and small businesses, and make no mistake about it, the big winners are countries like China and India who are champing at the bit to take our jobs and the same Wall Street speculators who brought our country's financial markets to near collapse and who stand to gain billions in new profits by creating a trading scheme for these carbon credits. Instead of shipping millions of good jobs overseas and killing our energy economy, Congress should support an all-of-the-above national energy policy that will create American jobs by utilizing our Nation's natural resources to reduce our dependence on Middle Eastern oil and promote alternative sources of energy like wind, solar and nuclear.

Along with many of my colleagues, I am proud to be a cosponsor of H.R. 2300, the American Energy Innovation Act, legislation that takes this all-of-the-above approach, and the net effect of our comprehensive energy plan will result in lower carbon emissions because American jobs and manufacturing will not be shipped to foreign countries like China that have lower environmental standards than we have today here in America. Thank you, and I yield back.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Utah, Mr. Matheson.

OPENING STATEMENT OF HON. JIM MATHESON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH

Mr. MATHESON. Thank you, Mr. Chairman. I think the issue of how you structure an allowance program is extremely complicated and it is very important that we hold this hearing to create better understanding for all the ramifications the way that this has been structured now and see if there are suggested improvements. I hope as we move forward with this hearing—I have not had a chance to read all the pre-filed testimony but I would hope as we move forward in this hearing that the panel can shed some light on the impacts of the allocation structure that is included in the bill as it is written now which shows that half the allocations are based on total generation capacity and half on the fuel mix, if you will. I may be oversimplifying with that. It seems to me this draws into question the issue of different impacts on different regions of the country. Some regions are heavily based on nuclear, some heavily based on hydro. I come from a State where over 90 percent of the electricity is generated from coal, and I have been raising from

the outset of these climate change hearings the question of impacts in terms of regional income transfers and this specific topic today of the allocation structure of this bill is one of the key elements of regional impacts, in my opinion.

So I welcome the witnesses. I hope as we move through this hearing we can learn more about the impacts on different regions of the country, and if there are problems with the current allocation structure written in the bill, I look forward to suggestions that people think might be a better way to address that concern. With that, I yield back, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Florida, Mr. Stearns.

OPENING STATEMENT OF HON. CLIFF STEARNS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. STEARNS. Thank you, Mr. Chairman, and as Ranking Member Barton has indicated, we are hoping there will be more than one of these hearings. I know that Mr. Waxman and yourself have indicated that we would have at least one, and I think it is to your credit to have this hearing as well as ours because I think judging from the participation of our witnesses, this will be a great opportunity for us to ask questions.

We have the estimate from CBO, we have the Heritage Foundation. I am going to mention this briefly. So there is quite a diverse opinion here on the impact of this cap and trade. As mentioned by others, the CBO has indicated that this would hurt families by imposing an $850 billion energy tax that would obviously be paid by every American family. If you are going to drive a car, buy anything American or just simply turn on a light, you are going to be faced with the possibility of increased taxes. The Heritage Foundation, their projections to 2035 are pretty dramatic. Now, I don't know if they take into account inflation, which would normally occur, but they say it would raise electricity rates almost double and raise gasoline prices, raise residential natural gas prices by almost 60 percent, increase the federal debt by 26 percent and additional enormous costs for families. So the resulting higher energy rates will be especially hard, I think, on the poor, the elderly, low income, particularly those individuals in my district who spend most of their paycheck on service industries, gas, groceries and cooling their homes.

During the Energy and Commerce Committee markup, we offered numerous amendments, simple amendments that I thought would simply pass with bipartisan support, we thought to improve the bill to protect these American families from paying these massive new taxes, but they were defeated almost along party lines, so Mr. Chairman, in the end, this is really your bill. This is not a bill that is supported by the Republicans and so you will have to make the case why Americans should be saddled with an $850 billion new tax, particularly in light of the economy now that can least afford it.

So, you know, I think fostering new technology and scientific research instead of capping our economy and trading U.S. jobs is a better guard to our Nation's security and increase our energy independence, and with that, I yield back.

Mr. MARKEY. Great. We thank the gentleman. The Chair recognizes the gentleman from Georgia, Mr. Barrow.

OPENING STATEMENT OF HON. JOHN BARROW, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF GEORGIA

Mr. BARROW. I thank the chairman. All of us, I think, are depending on technological breakthroughs to get us something we don't have right now, and that is new sources of energy that are clean, cheap and abundant. Mr. Barton talks about fundamental disagreements. I am going to outline another one.

So far, everybody who has talked has depended on increases in the cost of dirty energy to provide the incentive or the conditions to create this thing we don't have yet, the technological breakthroughs we need. The do-nothing crowd says we can wait and let natural forces of supply and demand produce the crash in prices that will produce the incentives to folks to develop what we need. The do-something crowd says we need a controlled crash in advance of that condition before Florida is awash with water so we can try and, you know, accelerate the research and development in a sort of trickle-down fashion. I think we ought to disenthrall ourselves from the whole idea that increasing the cost of dirty energy is the best way to come up with new sources of clean energy. It certainly ain't the best way and it is certainly not the only way. We also ought to disenthrall ourselves of plans that were adopted at the State level or the result of regional cooperation which really reflect the limits of what States acting together or independently can do under the Constitution. It seems that the folks that are pushing that idea are determined to impose the limits of State power acting alone or in concert with other States on our national efforts.

What we are talking about here is a plan to redistribute the proceeds of a plan to deliberately increase the cost of dirty energy in order to create some sort of supply of new energy that is cheap, clean and abundant. What I think we ought to do is recognize that that is going to provide uncoordinated research and development. It is going to provide resources that are weaker, inherently weaker than what we can do at the national level. What I think we need is not a program that depends on a price crash but a program that depends on a crash program of sustained public investment in research and development and deployment of clean sources of alternative energy. That is a level of fundamental disagreement that I haven't heard yet and that is where I come from on this. I think it is incumbent on those of us who are dissenting from this approach to set forth our vision of how we can do a better job that is more effective and more coordinated, and with that, Mr. Chairman, I yield back.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Washington State, Mr. Inslee.

OPENING STATEMENT OF HON. JAY INSLEE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mr. INSLEE. Thank you.

Several people have mentioned China as an excuse for doing nothing on this problem. We just spent a week in China with the Speaker. I thought I would make three points about why we should

assume our traditional role as world leaders in America on this subject.

Number one, in this bill we have provided protection for American workers in trade-sensitive energy-intensive industries in steel, aluminum, paper, by providing 15 percent of the allocations to these industries so we do not have to concern ourselves about job leaking to China in these trade-sensitive energy-intensive industries. Mike Doyle and I worked on that, and thanks to the Chair we got it in this bill.

Point number two: China is acting on energy today in three ways that we are not even today. Number one, they have a 20 percent reduction of energy intensity from a carbon perspective, CO_2 perspective. Number two, they have a 15 percent renewable energy portfolio. Number three, they have a corporate average fuel economy standard even more aggressive than ours. And it is a certain irony today to me that some people here are arguing we should not act using China as an excuse when those are the same people who would not even allow America to do that tomorrow which China has already done yesterday. They are actually taking steps on this problem which we have not even taken yet, and unfortunately, some of my colleagues across the aisle have resisted taking those actions.

Point number three: They have not done enough and we are going to be pressing them to do more. It is clear that we need to ask them to do more, given the rise in the number of their plants without coal sequestration that they are using right now. But it makes no sense to me whatsoever to continue to provide China an excuse for further inaction by inaction on our own part. When it comes to china, we ought to think of two things: one, they are acting; two, they are not going to act more unless we start to act.

This is a start of a clean energy revolution which both countries can benefit from. We ought to continue this effort. Thank you, Mr. Chairman.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from Louisiana, Mr. Melancon.

OPENING STATEMENT OF HON. CHARLIE MELANCON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF LOUISIANA

Mr. MELANCON. Thank you, Mr. Chairman. This committee has set a new high bar for work on a single legislative issue and I commend the members and the staff for their dedication to this important issue. While this committee has hosted many hearings and I think this hearing is helpful in working to fully understand this, I do have a few concerns.

First, what are the real cost impacts on the consumers? We know that EPA has come up with an estimate of around $140 per family per year, but I don't believe those numbers are modeled on RPS or an RES and I don't believe that the allowance allocations were included in the analysis either. But also on the other side, I do believe that the estimates of $3,100 per family were obviously a bit exaggerated to the other side. So my question is, what are the real numbers and can we get those at some point in time in a timely manner?

Second, what is the net job creation minus the carbon-related job loss and will those jobs be more regional or spread out. My concern in Louisiana is, I am for green jobs but I am not for giving up the good-paying jobs that I have in south Louisiana in hopes of getting some new jobs in other parts of the country. As mentioned earlier by one member of the committee, this shouldn't be about who wins and who loses. This should be about us all having some skin in the game and this country moving forward in a positive way that benefits all of us in the long run.

Thirdly, what tools can we use to moderate the impact on transportation fuels? Providing an allowance relief to cogenerate electricity producers was an admirable move to ensure that our constituents that are struggling through the current tough economic times won't be even more burdened by high utility prices. As a representative for a rural district, I have to worry about the people who regularly drive long distances as a requirement for their employment or commute. Developing similar cost containment measures for transportation fuels would be helpful to many people facing high gas prices this summer. I particularly have a son that commutes quite a long ways every day and the concern that he has already is a concern for me as a parent.

So these are concerns of mine and my constituents in south Louisiana, and I don't think I have any time to yield back but I thank you for the opportunity to comment.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentleman from New Jersey, Mr. Pallone.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman.

The allocation of emission allowances is one of the most important policy provisions in the Clean Energy and Security Act. These allowances will protect consumers, invest in clean energy and energy-efficiency programs and help trade-exposed industries make the transition to clean energy technologies.

The allocations for renewable energy and energy efficiencies are particularly important to me. States will receive 10 percent of allowances from 2012 through 2015 to invest in programs that will help meet the renewable electricity standard. My State, New Jersey, has one of the most aggressive renewable electricity standards in the country requiring that 20 percent of our electricity needs come from renewable energy by 2020. By investing allowances in clean energy and energy efficiencies, we are helping States like New Jersey meet these goals.

I have always been a strong advocate for renewable energy programs and I believe Congress should be doing as much as possible to encourage investments in renewables. This will help us not only reduce greenhouse gases in this country but it will also create clean energy jobs. Hard choices were made with regard to the final allocation formula that passed through this committee and those choices will ensure that we take a huge step towards cutting greenhouse gas emissions and investing in a clean energy economy. The committee did a good job, in my opinion, to ensure that consumers

are protected, critical investment in clean energy and energy efficiency programs are included, and industry is not harmfully affected by the cap on greenhouse gas emissions. Thank you, Mr. Chairman.

Mr. MARKEY. Great. The gentleman's time has expired. The Chair recognizes the gentlelady from Wisconsin, Ms. Baldwin.

Ms. BALDWIN. Thank you, Mr. Chairman. I am going to waive my opening statement so that we can hear from the witnesses, other than to thank you for holding two important additional hearings to perfect the record this week. Today's hearing on allowances and Friday's hearing on transmission-related issues. I believe that these hearings will allow us to perfect or further complement the legislation that was already reported favorably by the full committee, and I appreciate the fact that you are holding these two additional hearings this week.

Mr. MARKEY. I thank the gentlelady. Although he is not a member of the Subcommittee on Energy and Environment, Mr. Terry is here from Nebraska and by unanimous consent we can allow him to make an opening statement if he would like.

Mr. TERRY. Yes, I would. Thank you.

Mr. MARKEY. The gentleman is recognized.

OPENING STATEMENT OF HON. LEE TERRY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEBRASKA

Mr. TERRY. I appreciate holding this hearing on what is somewhat mysterious because of its complexity, the allowances and how they work, and it will be fun, I think, as well as educational for us.

I have some difficulties getting my mind around the whole concept of cap and trade when there are alternatives such as cap and incentives or plans that we could have taken offline older, inefficient, coal-fired plants and perhaps replace them with clean and efficient nuclear power plants. Why all those type of concepts were just routinely discarded baffles me but on we go.

But I have the pleasure here of having a constituent at the witness table in David Sokol. David is one of Omaha's preeminent business executives and philanthropists. I have known him for a long time, about 20-some years. He is the CEO of Mid American Energy Holdings. There is a variety of energy companies within that holding generating electricity and also pipelines with natural gas, and one of the things that I appreciate about Mr. Sokol is he studies the issue. In fact, he may have been ahead of the curve in reading the bill before most of the members probably had a chance to even read the bill. So I am pleased to have him here. He is straightforward, common sense, a little bit out of the box which I respect and appreciate, so I welcome Mr. Sokol.

Mr. MARKEY. The gentleman's time has expired, and all time for opening statements has expired. I would just like to for the record make it clear that there is absolutely nothing in the legislation that requires a compulsory copyright transfer, and that is one of the reasons why the Judiciary Committee has not been given a referral of this legislation because there is nothing in the bill on patents or copyrights, so I just want the record to reflect that in terms of transfer of patent or copyright interests that is affected by the bill.

Now let us turn and recognize our first witness, Mr. Thomas Farrell. He is the chairman, the president and CEO of Dominion, who will speak today as a board member of the Edison Electric Institute. Mr. Farrell is also a board member of the Institute of Nuclear Power Operations and of the Council of Foreign Relations, an independent task force on climate change. Thank you so much, Mr. Farrell, for being with us here today. Whenever you are comfortable, please begin.

STATEMENTS OF THOMAS F. FARRELL, II, CHAIRMAN, PRESIDENT AND CEO, DOMINION (ON BEHALF OF EDISON ELECTRIC INSTITUTE); RICH WELLS, VICE PRESIDENT, ENERGY, DOW CHEMICAL COMPANY; DAVID SOKOL, CHAIRMAN OF THE BOARD, MID AMERICAN ENERGY HOLDINGS COMPANY; STEVE COUSINS, VICE PRESIDENT, REFINING, LION OIL; G. TOMMY HODGES, CHAIRMAN, TITAN TRANSFER, INC., (ON BEHALF OF THE AMERICAN TRUCKING ASSOCIATION); DAVID MONTGOMERY, VICE PRESIDENT, CHARLES RIVER ASSOCIATES; NAT KEOHANE, ECONOMIST, ENVIRONMENTAL DEFENSE FUND; AND REVEREND DR. MARI CASTELLANOS, MINISTER FOR POLICY ADVOCACY, UNITED CHURCH OF CHRIST, JUSTICE AND PEACE MINISTRIES

STATEMENT OF THOMAS F. FARRELL II

Mr. FARRELL. I thank Chairman Markey and Ranking Member Upton and members of the committee. Thank you for the opportunity to provide testimony on the allocation emission allowances under the American Clean Energy Security Act.

Dominion Resources, to give you some perspective, is one of the Nation's largest integrated electric and natural gas companies with operations in the Midwest, Northeast and Mid-Atlantic regions of the country. Our corporate headquarters is in Richmond, Virginia. We are active along the entire energy production delivery chain. We operate a large fleet of nuclear, oil, coal, gas-fired and renewable energy facilities, both regulated and merchant. Slightly more than half of our electric output is fossil fired. We also operate natural gas pipelines, gas storage structures, L&G importation facilities and we explore for and produce natural gas. We serve about 5 million retail customers in 12 States.

I am appearing before you today on behalf of the Edison Electric Institute. EEI member companies serve 95 percent of the ultimate electricity customers in the investor-owned segment of the industry and account for about 70 percent of the total U.S. electric power business. EEI has endorsed an economy-wide cap-and-trade program to reduce greenhouse gas emissions that includes provisions to mitigate the cost impacts on electricity customers and the economy. Under any scenario, it will be expensive to transform the United States into a low-carbon society. It will take effective carbon regulation and the development and deployment of a full range of climate-friendly technologies to get the job done, some of which are commercially available now and some of which are not.

EEI's membership spent 2 years developing a circumstances proposal to minimize the economic impact of reducing carbon emissions for all electricity consumers, especially the low-income fami-

lies and energy-intensive businesses and industries that will suffer the most from higher electricity costs. The allowance allocation formula in H.R. 2454 is the essence of the EEI proposal. The allowance allocation concept has the broad support of a variety of shareholders including the U.S. Climate Action Partnership, labor groups and EEI and its member companies. The allowance allocation method we support offers the best means of protecting electricity consumers of all types, large and small, rural, urban and suburban, without sacrificing the desired environmental improvements. Consumers can be assured that whether they receive electricity from a shareholder-owned utility, an electric cooperative or municipal utility, they will receive the benefits of the allowance program provided for in the legislation.

The bill's allowance allocations to the power sector amount to 35 percent of the total annual allowances available to all major sectors of the economy covered by the bill. About 30 percent go to local distribution companies and about 5 percent will go to merchant coal generators and other generators with long-term power purchase agreements until direct allocations begin to decline from 2026 through 2030. A longer phase-out period is one of the modifications of the bill that EEI seeks. H.R. 2454 currently provides for allowances to decline precipitously from 35 percent to zero in the 5-year period from 2025 to 2029. Because the emission cap declines sharply from 2020 to 2030, consumer protection will be strengthened if allowances are phased our more gradually.

The bill specifies that these allowances must be used exclusively for the benefit of retail ratepayers. The allocation proposal ensures that all classes of electricity customers receive the benefits of the value of the emissions allowances regardless of the size, location or ownership structure of the LDC. Targeting LDCs as the primary recipient of the allowances ensures that the benefits and costs of those allowances flow directly to end-use consumers. LDC rates are regulated by State commissions. These commissions have extensive oversight experience and authority to ensure that allowances received by LDCs will be reflected in any rate-making cases. The bill enhances the role of State commissions and includes safeguards to ensure that allowances directly benefit customers. Allocations to LDCs can also take into account regional variations in electricity use generation mix and cost. Different regions use different amounts of fossil fuel to produce electricity. Some regions use more coal than others. Average customer demand for electricity also varies significantly by region due to such things as weather and the price of power.

We are pleased that the bill provides direct allowances to the electricity sector in the early years of the program. This feature of the bill is critical to protecting consumers until new technologies are available to enable the continued use of our domestic coal resources. It is important to note, however, that significant costs remain for the utility sector to comply with major programs in this Act. The renewable electricity standard and the climate cap-and-trade program will require significant financial investments to either change the current generation profile, purchase renewable energy credits or offsets, make alternative compliance payments, purchase allowances from auction or some combination of all of these.

H.R. 2454 distributes emissions allowances to LDCs based on a calculation of each LDC's share of the total LDC allowance pool. To give equitable treatment to the concerns of different local distribution companies, the distribution of allowances follows a 50/50 formula, 50 percent based on each LDC's share of average annual electric sector CO_2 emissions during the base period including emissions associated with purchase power and 50 percent based on each LDC's share of average annual electricity retail sales during the base period. The emissions component of the formula recognizes the concerns of utilities with significant fossil generation that their customers will face higher compliance costs. Emissions-based allowances would help offset those costs. The sale component recognizes the concerns of other utilities whose customers already face higher prices resulting from utility investments in carbon-free power generation.

Mr. MARKEY. Mr. Farrell, if you could summarize, we would appreciate it.

Mr. FARRELL. It would be my pleasure. We will, I am sure, get into discussions about what happens with merchant coal generators, a very important part of the bill.

In sum, we believe the allowance allocation approach set forth in the bill will moderate the economic impact of greenhouse gas regulation on electricity consumers nationwide, especially during the early years of the program. We commend the committee for the hard work it has done to craft a climate policy that successfully reduces greenhouse gas emissions while addressing the cost implications to consumers and the economy. Thank you, Mr. Chairman.

[The prepared statement of Mr. Farrell follows:]

Written Testimony

Thomas F. Farrell II
Chairman, President & CEO – Dominion

On behalf of
The Edison Electric Institute

Before the U.S. House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Environment

Hearing on Allocation of Emissions Allowances

June 9, 2009

Chairman Markey, Ranking Member Upton, and members of the Subcommittee, I am grateful for the opportunity to appear before the House Energy and Commerce Committee's Subcommittee on Energy and the Environment to offer testimony on the allocation of emissions allowances under the American Clean Energy Security Act of 2009.

My name is Tom Farrell. I am the chairman, president and CEO of Dominion Resources, a leading provider of commodity energy and energy services in the Midwest, Northeast and Mid-Atlantic regions of the country. Our corporate headquarters is located in Richmond, Va.

Dominion owns and operates a $42 billion energy network that includes more than 27,000 megawatts of electric generating capacity and 1.2 trillion cubic feet equivalent of proved natural gas and oil reserves in the Appalachian Basin. Our transportation and delivery infrastructure includes 14,000 miles of natural gas transmission, gathering and storage pipeline and 6,000 miles of electric transmission lines. We operate the nation's largest underground natural gas storage system, with 975 billion cubic feet of storage capacity. We also serve more than 5 million retail electric and natural gas customers in 12 states.

Dominion operates both regulated and merchant electric generating facilities in the northeastern quadrant of the U.S. We are in the top third of the electric industry in terms of carbon efficiency – the amount of CO_2 produced per unit of output. About two-thirds of our total generating capacity is regulated and one-third is merchant generation. Slightly more than half of Dominion's total electric output is fossil-fired. The remainder is emissions-free nuclear and renewable power, primarily hydro, wind and biomass. Dominion's renewable portfolio includes a 50-percent interest in the two largest wind farms east of the Mississippi River.

I am appearing before you today on behalf of the Edison Electric Institute. EEI is the trade association of U.S. shareholder-owned electric companies, with international affiliate and industry associate members worldwide. The U.S. members of EEI serve 95 percent of the ultimate electricity customers in the shareholder-owned segment of the industry and account for about 70 percent of the total U.S. electric power business.

Introduction

EEI has endorsed climate change principles intended to help ensure that U.S. climate policy is successful in reducing greenhouse gas (GHG) emissions while also addressing the cost implications to consumers. This framework calls for an 80-percent reduction in GHG emissions from current levels by 2050, together with a series of actions to mitigate impacts to electricity customers and the economy.

Under any scenario, reductions in greenhouse gas emissions will be expensive. The most cost-effective way to achieve them in the power sector is through the development and deployment of a full portfolio of climate-friendly technologies and measures over the long term. These include:

- Supply- and demand-side energy efficiency initiatives;
- Renewable energy projects;
- Advanced coal technologies integrated with carbon capture and storage (CCS);
- New nuclear power plants;

- Plug-in hybrid electric vehicles; and
- Smart grid applications.

Some of these technologies are commercially available now (many at a higher cost than conventional generation sources) while others are not. The availability of all of these technologies will be critical if we are to achieve our dual goals of reducing GHG emissions and maintaining reliable, affordable and clean electricity supplies in a carbon-constrained world.

Although technology applications are certainly a necessary component of climate change policy, in and of themselves they are incomplete. EEI's membership spent two years developing a consensus proposal to minimize the economic impact of reducing carbon emissions for all electricity consumers – especially the low-income families and energy-intensive businesses and industries that will suffer the most from higher electricity costs. We thoroughly examined numerous proposals brought forth by EEI member companies and carefully evaluated the rate impacts on our customers. Through extensive modeling, we learned that some proposals widened the disparity in electricity rates across the nation while others reduced this rate spread.

The allowance allocation formula contained in H.R. 2454 is the essence of the EEI proposal. The allowance allocation concept has the broad support of a variety of stakeholders, including the U.S Climate Action Partnership (USCAP), labor groups, and EEI and its member companies.

I will describe our mechanism for allocating allowances and explain why it offers the best means of protecting electricity consumers of all types – large and small, rural, urban and suburban – without sacrificing the desired environmental improvements. Consumers can be assured that whether they receive electricity from a shareholder-owned utility, an electric cooperative or a municipal utility, they will receive the benefits of the allowance program provided for in this legislation.

Key Allowance Allocation Provisions of H.R. 2454

The allowance allocations to the power sector as provided for in H.R. 2454 amount to 35 percent of the total annual allowances available to all major sectors of the economy covered by the bill, starting in 2016. According to the Committee, 30 percent of all allowances will go to local distribution companies (LDCs) and about 5 percent will go to merchant coal generators and other generators with long-term power purchase agreements until direct allocations begin to decline in 2026 and phase out by 2030.

A longer phase-out period of transitional allowances is one of the modifications to the bill that we seek. H.R. 2454 currently provides for allowances to quickly decline from 35 percent to zero in the five-year period from 2025 to 2029. Because the emissions cap declines sharply from 2020 to 2030, consumer protections would be strengthened if allowances were phased out more gradually.

EEI believes these allocations to the electric sector are critical to holding down costs to electricity customers – our fundamental and overriding concern. And just as we believe there should be no exemption for any industry or particular fuel in a climate cap-and-trade regime, so we believe there should be no exclusion of merchant coal generators from the allowance allocation program. I will return to this subject later.

By design, H.R. 2454 allocates 30 percent of *all* allowances to LDCs, the wires companies that provide retail electric service to end-use consumers. The bill specifies that these allowances must be used exclusively for the "benefit of retail ratepayers." The allocation proposal found in new Clean Air Act section 783 ensures that *all* classes of electricity customers receive the benefits of the value of the emissions allowances, regardless of the size, location or ownership structure of the LDC.

Targeting LDCs as the primary allowance recipients ensures that the benefits and costs of those allowances flow directly to end-use electricity consumers. LDCs connect with every electricity

customer—residential, commercial and industrial. They are the entities best equipped to ensure that customers see any costs or benefits derived from the value of the allowances.

LDCs also monitor, record and bill customers for the amount of electricity they use. For that reason, they have a built-in, practical and efficient system in place to flow through the costs and benefits of allowances to their customers.

In addition, LDCs have extensive experience and numerous programs to identify and serve low-income customers. They are in a good position to work with their state public utility commissions (PUCs) to design programs that address industrial customers as well as low-income customers, which supports an important goal of this legislation.

A second important point is that LDC rates are regulated by state commissions. These PUCs have extensive oversight experience and authority to ensure that allowances received by LDCs will be reflected in any ratemaking cases. The bill enhances the role of state commissions and includes safeguards to ensure that allowances directly benefit consumers. EPA is granted specific authority to suspend the awarding of allowances in the event that any PUC or LDC does not use these allowances appropriately.

The utility ratemaking process provides transparency and accountability through a time-tested, public mechanism. Allowance allocations to LDCs under strict PUC supervision should address any concern that utility shareholders would benefit from the allocations instead of customers.

Third, allocations to LDCs can take into account regional variations in electricity use, generation mix and costs. Different regions use different amounts of fossil fuel to produce electricity. Some regions use much more coal than others. Average customer demand for electricity also varies significantly by region, due to such things as weather and the price of power.

In sum, the allocation approach for LDCs that EEI supports has sufficient flexibility to manage and accommodate all of these factors.

Determining Allocations to LDCs

We are pleased that H.R. 2454 provides direct allowances to the electricity sector in the early years of the program. This feature of the bill is critical to protecting consumers until new technologies are available to enable the continued use of our domestic coal resources, and until such time as new low-carbon infrastructure can be built.

It is important to note, however, that significant costs remain for the utility sector to comply with major programs in this Act. The Combined Efficiency and Renewable Electricity Standard and the climate cap-and-trade program will require significant financial investments to either change the current generation profile, purchase renewable energy credits or offsets, make alternative compliance payments, purchase allowances from an auction, or some combination thereof.

H.R. 2454 distributes emission allowances to LDCs based on a calculation of each LDC's share of the total "LDC allowance pool." To give equitable treatment to the expressed concerns of different LDCs, the distribution of allowances will follow a 50/50 formula: 50 percent based on each LDCs share of average annual electric sector CO_2 emissions during the base period (including emissions associated with purchased power) and 50 percent based on each LDCs share of average annual electricity retail sales during the base period.

The EEI approach resulted from years of discussion among its diverse members. It is a blend that responds to varying profiles of companies located in different regions of the country, operating with different fuel strategies and serving different customer needs.

EEI's proposal recognizes that the increased costs of a CO2 cap comes from multiple factors, including the cost of purchasing allowances to cover a utility's own generation, the added fuel costs from reducing coal generation and increasing natural gas generation to comply with the cap, as well as the impact of both of these factors on the price of purchased power.

The emissions component of the formula recognizes the concerns of utilities with significant fossil generation that their customers will face higher compliance costs. Emissions-based allowances would help offset those costs. The sales component factors in the concerns of other utilities whose customers already face higher prices resulting from utility investments in non-emitting power generation.

The 50/50 allocation formula recognizes the validity of both views and ensures that all LDCs are treated the same, regardless of their ownership structure. In short, any LDC that delivers electricity directly to retail consumers – whether it is a shareholder-owned utility, an electric cooperative or a municipal utility—will receive allowances under this program.

Determining Allocations to Merchant Coal Generators

Merchant coal generators sell coal-fired power into competitive wholesale markets where prices are set by market forces and are not subject to state PUC regulation. These merchant generators produce more than 20 percent of total U.S. coal-fired generation.

EEI, as well as USCAP and labor groups, recognize that providing allowances to these generators is essential to ensuring an affordable and reliable supply of electricity during the transition to a low-carbon economy. The continued viability of these generators is critical to maintaining adequate competition in competitive markets, assuring reliability and holding down costs to consumers. Consumers in competitive markets also deserve protections from potential cost increases from reducing GHG emissions.

We believe that H.R. 2454 incorporates valuable safeguards on the use of allowances provided to merchant coal generators as follows:

(1) Merchant generators receive a proportional share of allowances based on one-half of their base-year emissions. Even at the maximum allocation, they will always have to purchase allowances to cover their net compliance costs.

(2) The bill calls for a cap on the share of electric sector allowances available to merchant facilities, which would decline over time.

(3) The bill ensures that allowances to merchant coal generators will be based on actual emissions that occur in the prior year. This ensures that no allowances will be awarded to facilities that are retired. If a plant is retired, its qualifying emissions will be zero and no allowances will be provided for that facility in the following year. If the plant's output declines, it receives fewer allowances. This guards against any generator receiving allowances for emissions that are not occurring and thus protects against concerns about "windfall profits."

As I have previously discussed, we agree that an enhanced role for state PUCs as provided in the bill will be an effective tool for ensuring that LDCs use allowances to directly benefit consumers. However, state commission oversight is not the only method to ensure that allowances mitigate consumer costs.

In competitive markets, it is evident that a limited number of allowances for merchant generators is necessary to help defray the substantial costs of complying with emissions reduction targets. H.R. 2454 directs EPA, working with FERC, to examine and address any potential "windfall profits" or substantially disparate treatment.

As the entire electricity industry invests in new generation to meet renewable energy targets and develops new CCS technologies to ensure a future role for domestic coal, allowances provide a sound public policy platform to help meet the declining cap on emissions.

Determining the Relative Size of LDC and Merchant Generator Allowance Pools

The bill caps allowances available to the merchant generator pool at 10 percent of the total annual allowances provided to the electricity sector. That means the maximum amount of allowances available to merchant generators in any given year is 3.5 percent.

The total amount of allowances issued to merchant generators is then deducted from the total electricity sector allocation to determine the LDC allowance pool. The LDC allowance pool is then allocated to individual utilities using the formula explained earlier. As the emissions cap declines over time, and as the allowances allocated to the electricity sector decline, so will the number of allowances allocated to LDCs and merchant coal generators.

Conclusion

EEI again wishes to commend this Committee for its hard work on the enormously challenging issues related to climate change. The complexity of the allowance distribution formula in the bill is a reflection of the complex nature of the electric industry, with its diverse generating facilities, fuel sources and state regulatory arrangements.

We believe the allowance allocation approach in this bill will minimize the economic impact on electricity customers nationwide during the early years of a federal GHG cap-and-trade program. It also will help ensure that utilities continue to provide reliable, reasonably priced electric service that supports economic growth, job creation and strong communities.

We look forward to continuing our work with the Committee to help ensure that U.S. climate policy is successful in reducing GHG emissions while also addressing the cost implications to consumers.

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Mr. MARKEY. Thank you, Mr. Farrell, very much.

Our second witness is Mr. Rich Wells. He is the vice president for energy at the Dow Chemical Company, where he is responsible for Dow's complete energy portfolio. He has been a member of the board of directors of the Alliance to Save Energy. We welcome you, Mr. Wells. Whenever you are ready, please begin.

STATEMENT OF RICH WELLS

Mr. WELLS. Thank you, Mr. Chairman and members of the committee. I thank you for the opportunity today to comment on the allowance allocation provisions of the American Clean Energy and Security Act.

I am vice president of energy for the Dow Chemical Company, a leading specialty chemical and advanced materials company with over 50,000 employees, half of which are located here in the United States. While we are known as an energy-intensive company, Dow also makes products that help consumers save energy and reduce their greenhouse gas emissions. As an example, our thermal insulation and foam sealant products can reduce home and business energy costs by up to 30 percent. In fact, the recent lifecycle assessment found in emissions reductions from the use of Dow insulation products were seven times greater than our company's total annual emissions. So as you can see, American energy-intensive companies can and do develop products that help lower the overall carbon footprint of our economy.

In order for the cap-and-trade system proposed in the committee bill to be economically sustainable, it must be designed in a way that allows American energy-intensive and trade-exposed manufacturers to remain globally competitive in the face of rising energy costs. When I testified before this committee in April, I said that it was critical under the competitiveness title that the output-based rebates be adequate to cover direct and indirect emissions associated with sectors that meet the energy-intensive and trade-exposed criteria. Since that time the committee has allocated 15 percent of the total number of allowances toward this purpose. We believe the committee has made a reasonable allocation choice based on available information. However, due to the uncertainty surrounding indirect emissions, we urge continued study of this issue as the bill is further reviewed by Congress.

We are, however, concerned that the current bill phases out the amount of allowances for energy-intensive and trade-exposed sectors before carbon leakage is addressed. We urge the committee to continue to study this issue to ensure that there is adequate allocation of allowances until such time that the carbon leakage problem is solved through an international agreement. If we do not properly address this issue, then we will fail to protect American jobs and the manufacturing sector.

Also in April, I testified that the compensatory allowance provision for feedstock material was restrictive to the point where no company would be able to claim a single allowance for using fossil energy in non-emissive ways. We would like to thank the committee for modifying that provision which we now believe does not punish those companies that use hydrocarbons as raw materials to make non-emissive products.

One of the easiest ways to meet aggressive short-term emission reduction targets is through fuel switching from coal to natural gas in the power sector. Too strong a price signal on carbon would accelerate this movement which is already underway, even in the absence of climate change legislation. If fuel switching is excessive, demand for U.S. natural gas will rise and American manufacturers that depend upon this energy source will suffer. Dow supports the allocation of some portion of free allowances to coal-fired power generation to help minimize fuel switching.

For the same reason, we also support the allocation of bonus allowance to promote carbon capture and storage deployment. It is critically important that the bill be designed to minimize the cost imposed on U.S. manufacturers. That is why we should not assume allowance allocation alone can address all the challenges posed by cap and trade for the manufacturing sector. For instance, compensatory allowances will not cover all the fossil energy Dow purchases as a feedstock material. Likewise, allowance allocation will lessen but it won't eliminate fuel switching from coal to natural gas. Therefore, in order to complement allowance allocation measures and to keep U.S. manufacturers globally competitive, we think it would be better for the 2020 target to reflect the 14 percent reduction from 2005 levels rather than a 17 percent reduction. We also believe the bill's excessive procedural hurdles on offsets will result in high-quality legitimate offsets being excluded.

Mr. Chairman, we commit to working with you and others to further refine the basic provisions to assure the competitiveness of energy-intensive and trade-exposed industries. I thank you for the time today. I would be happy to answer your questions when appropriate.

[The prepared statement of Mr. Wells follows:]

The Dow Chemical Company

STATEMENT FOR THE RECORD

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
COMMITTEE ON ENERGY AND COMMERCE

HEARING ON

Allowance Allocation Policies in Climate Legislation:
Assisting Consumers, Investing in a Clean Energy Future,
and Adapting to Climate Change

June 9, 2009

Submitted By:
Rich Wells
Vice President, Energy

The Dow Chemical Company appreciates the opportunity to submit these written comments to the Subcommittee on Energy and Environment, Committee on Energy and Commerce on the allowance allocation provisions of H.R2454, "The American Clean Energy and Security Act of 2009".

Dow was founded in Michigan in 1897 and is one of the world's leading manufacturers of chemicals and plastics. We supply products to customers in 160 countries around the world, connecting chemistry and innovation with the principles of sustainability to help provide everything from fresh water, food, and pharmaceuticals to paints, packaging, and personal care products

Dow is committed to sustainability. We have reduced our absolute levels of greenhouse gas (GHG) emissions 22% since 1990, and we are committed to do even better in the future. Our ambitious 2015 sustainability goals underscore this commitment.[1]

Dow is an energy-intensive company. We use energy, primarily natural gas and natural gas liquids, as a feedstock material to make a wide array of products. For its global operations, Dow uses the energy equivalent of 850,000 barrels of oil every day. This amount is more than the oil consumption of some countries, such as The Netherlands or Australia.

Because roughly half of our operating costs are energy costs, Dow is actively investigating and moving forward on alternate feedstock materials such as glycerin to propylene glycol (for use in antifreeze) and soy to polyols (for use as cushioning in furniture).

In addition to being relatively energy-intensive, Dow products help consumers save energy and reduce GHG emissions. For the home or business, our insulation and polyurethane foam sealants can reduce home and business energy costs by 20%-30%. In 2008, a third-party validated lifecycle assessment found that the avoided emissions from the use of Dow insulation products in service are about seven times greater than our company's total annual emissions.[2] For saving energy on the road, our new diesel particulate filter technology enables improved environmental performance and fuel efficiency. We offer amines technology to capture carbon dioxide emissions from the power sector. We also offer plastics, composites, and adhesives to help make cars stronger and lighter, while improving overall gas mileage. For the industrial sector, we have saved energy by down-gauging industrial stretch film, a process of making a plastic film thinner but stronger, so that less plastic (and feedstock energy) can be used while getting the same benefits in use.

This testimony focuses on allowance allocation under H.R2454 and how the allocation of allowance value helps to address the challenges faced by an energy-intensive, trade-exposed company under a US policy to control greenhouse gas (GHG) emissions. Specific focus is on free allowances for energy-intensive, trade-exposed sectors,

[1] To learn more about Dow's commitment to sustainability, go to our website at www.dow.com.
[2] To learn more, see our 2008 annual report at www.dow.com/financial/pdfs/161-00722.pdf

compensatory allowances for non-emissive use of fossil energy, and the use of allowance value to help minimize fuel switching in the power sector (from coal to natural gas).

On April 23, 2009—before the Committee developed an allowance allocation proposal—we testified before the Committee on these same topics. This testimony responds to the allocation decisions that have since been made by the Committee, and also identifies other important provisions of the Committee-passed bill that will have a significant impact on Dow's competitiveness.

USCAP Perspective

As a member of the U.S. Climate Action Partnership (USCAP), Dow supports prompt enactment of environmentally effective, economically sustainable and fair climate change legislation to reduce U.S. greenhouse gas emissions sharply by mid-century. The centerpiece of legislation should be an economy-wide cap and trade program. This market-based approach is the best way to put a price on carbon and ensure that short- and long-term emissions targets are met.

USCAP launched its landmark report, titled *A Call for Action*[3], in January 2007, which lays out a legislative framework for climate protection. Most recently, USCAP released *A Blueprint for Legislative Action*, which provides consensus recommendations for climate protection legislation. USCAP includes more than two dozen businesses and environmental organizations.[4] The coalition recognizes that the United States faces an urgent need to reinvigorate our nation's economy, make the country more energy secure, and take meaningful action to slow, stop, and reverse GHG emissions to address climate change. Thoughtful and comprehensive national energy and climate policy will help secure our economic prosperity and provide American businesses and the nation's workforce with the opportunity to innovate and succeed.

According to USCAP, manufacturers and industries that deal with certain commodity products that are both energy-intensive and trade-exposed will be particularly challenged by US climate policy if they face competition from countries that have not committed to an internationally recognized GHG-emission-reduction path. In such cases, there is a risk of "leakage", by which we mean the shifting of production (and jobs) and GHG emissions from the US to these other countries.

To remedy this situation, USCAP recommends that an adequate amount of allowance value be provided to US manufacturers facing such competition (determined by objective criteria). USCAP recommends that these allowances be tied to any GHG-related competitive imbalance and reduced or eliminated when the GHG-related competitive

[3] *A Call for Action* and *A Blueprint for Legislative Action* can be found at www.us-cap.org.
[4] The current members of USCAP are: Alcoa; Boston Scientific Corporation; BP America, Inc.; Caterpillar Inc.; Chrysler LLC; ConocoPhillips; Deere & Co.; Dow; Duke Energy; DuPont; Environmental Defense Fund; Exelon Corporation; Ford Motor Company; FPL Group; General Electric; General Motors Corporation; Johnson & Johnson; Natural Resources Defense Council; NRG Energy; PepsiCo North America; Pew Center on Global Climate Change; PG&E Corporation; PNM Resources; Rio Tinto; Shell Oil Company; Siemens Corporation; The Nature Conservancy; and the World Resources Institute.

imbalance is reduced or disappears. USCAP also believes that any provisions designed to address competitiveness should be consistent with World Trade Organization rules.

Maintaining US Competitiveness

The bill (Title IV, Subtitle A) includes provisions to provide compensation to energy-intensive, trade-exposed sectors that are at risk of leakage under a US program to control greenhouse gases. Representatives Inslee and Doyle have long championed this approach (as embodied in their bill, H.R.1759, the EMPLOY Act) , which Dow believes is the best way to address the competitiveness issue prior to an international agreement among major emitting countries or a global sectoral agreement.

The Inslee-Doyle approach proceeds in two steps. In the first step, EPA would identify energy-intensive, trade-exposed sectors that are at risk of leakage based on clear and objective criteria. In the second step, EPA would award rebates to eligible facilities to compensate them for some portion of their direct and indirect GHG emissions. The Inslee-Doyle approach is generally consistent with the approach outlined in the USCAP *Blueprint for Legislative Action.*

When we testified before the Committee on April 23, 2009, the allocation issue had not yet been addressed. At that time, Dow testified that he rebate be adequate to cover the direct and indirect emissions associated with the sectors that meet the criteria for eligibility. This perspective is widely shared among other energy-intensive sectors.

Since we testified, the Committee has allocated 15% of the total number of allowances toward this purpose. We are aware of studies that suggest this amount should be sufficient to fully compensate eligible sectors for direct and indirect emissions, but there is a fair amount of uncertainty, especially over indirect emissions. We believe the Committee has made a reasonable allocation choice based on the information currently available, but we urge continued research and study over this issue as the bill is further considered by Congress.

On April 23, we said it was critical that the rebate not be reduced or eliminated until the competitive disadvantage is reduced or eliminated. Targeted assistance to energy-intensive industries should be terminated only when the carbon leakage problem is solved through an international agreement. And, it should be phased down only in proportion to progress made in reducing the cost differentials between trading partners in a fashion that demonstrably reduces the disadvantage to domestic producers—not according to an arbitrarily defined timeline. The Committee-passed bill, however, phases down the amount of allowances for energy-intensive, trade-exposed sectors over time, perhaps before the leakage issue will be reduced or eliminated. We urge the Committee to continue to study this issue, and we urge the Committee to work closely with other committees to ensure an adequate allocation of allowances over time.

We note that there are many challenging implementation issues with this section of the bill. For example, determining the average GHG intensity by sector is particularly

challenging for any sector that doesn't make a homogeneous product using similar production technology. Sectors utilizing combined heat and power seek clarification as to how self-generated electricity and steam will be handled under this provision. We plan to work closely through our industry trade associations with both Congress and with EPA to ensure smooth implementation of this provision.

Protecting Feedstock Use of Fossil Energy

Other allowance provisions of the draft bill will impact competitiveness, and care must be taken to ensure these other provisions are designed to protect American manufacturing jobs.

The bill imposes a point of regulation not just on those who emit GHGs, but also on those who produce fossil energy (i.e., petroleum products). This means that there will be a price signal imposed not just on fossil energy that is combusted, but also on fossil energy that is used as a feedstock material to make carbon-based products that are not designed to be combusted and many of which help people save energy.

To minimize the price signal imposed on fossil energy used as a feedstock, the draft bill (Title III, Section 721f) would provide compensatory allowances to those who use fossil energy in non-emissive ways, such as a feedstock material. On April 23, we testified that the definition of "non-emissive use" was so restrictive that no company would be able to claim a single compensatory allowance. In addition, such compensatory allowances would not be bankable, and the timing of the issuance of such compensatory allowances was unclear.

To address these concerns, the Committee has since changed this provision, which we now believe does not punish companies for using fossil energy in a non-emissive manner.

Preventing a "Dash to Gas"

One of the easiest, and most likely, ways to meet aggressive, short-term emission reduction targets, such as those in the draft bill, is through fuel switching from coal to natural gas in the power sector. Too strong a price signal on carbon would exacerbate such a movement, which is already underway even in the absence of a US program to reduce GHG emissions. If fuel switching is excessive, demand for US natural gas will rise, and US manufacturers that depend on natural gas will suffer.

The fuel-switching solution could be economically ruinous for those industrial businesses and consumers dependent on affordable natural gas, if natural gas supply does not keep pace with rising demand, or if natural gas supply lags significantly behind demand. Recent US history suggests this is a plausible scenario.

Natural gas prices have skyrocketed by more than 460% over the last eight years. The increase in price volatility has significantly contributed to the US manufacturing sector

losing over 3.7 million jobs, the chemical industry losing nearly 120,000 jobs[5], and the permanent loss of nearly half of the US fertilizer production capacity. The manufacturing sector, which has limited fuel switching ability, has become the shock absorber for high natural gas costs. For the forest products industry, energy is the third largest manufacturing cost—up fifty percent in recent years for pulp and paper mills. For some mills, the cost has eclipsed employee compensation.

Dow first expressed alarm about high natural gas prices in 2002. At that time, our total annual energy and feedstock bill was $8 billion. In 2008, our energy bill was $27 billion. Our energy expenditures are by far the largest component of our production costs, and equate to about half of our total revenues.

Congress has been enticed into over-reliance on natural gas before. The Clean Air Act Amendments of 1990 were enacted with the belief that natural gas would be the clean fuel of the future and would be cheap and plentiful. Unfortunately, Congress did not anticipate the run-up in natural gas prices and the resulting demand destruction in the industrial sector.

We view the recent softening of natural gas prices to be associated with the weakening economy. We do not believe the current market prices for natural gas are indicative of the future. Congress must anticipate the future demand for natural gas as the economy rebounds. According to EPA/DOE analyses, cap and trade legislation will increase the demand for natural gas at least in the near-term (prior to 2030), as power companies find it economical to fuel switch from coal to less-CO_2-intensive natural gas. In the longer-term, fuel switching is of less concern as new technology is deployed to cost-effectively address GHG emissions from coal-fired power plants.

In designing a cap and trade program, several different elements (targets and timetables, cost containment, and complementary policies for coal and energy efficiency) will impact the degree of fuel switching, and Congress should keep all of these in mind as it develops a climate policy. Dow recommends that any US climate policy be designed in ways to minimize fuel switching.

Allocation of allowance value has a significant role to play in minimizing fuel switching. The bill allocates a significant share of allowances to local distribution companies (LDCs) to benefit their ratepayers. The bill also allocates free allowances to merchant coal generators. Dow supports the allocation of some portion of free allowances to coal-fired power producers as this will help to minimize fuel switching. For the same reason, Dow also supports the allocation of bonus allowances to promote CCS deployment.

[5] The chemical industry uses 1.93 trillion cubic feet (TCF) of natural gas annually, representing 8% of US natural gas consumption. The majority of steam boilers and cogeneration units in the manufacturing sector are powered by natural gas. The remainder is for feedstock purposes. Due to the historic abundance and low cost of natural gas in the USA, natural gas has been vital to domestic chemical production.

Other Issues Aside from Allocation

It would be wrong to conclude that allowance allocation alone can address all the challenges posed by a cap and trade bill for an energy-intensive US company. Some—perhaps many—of our products will not be considered energy-intensive and trade-exposed and therefore will be ineligible for free allowances. Compensatory allowances will not cover all of the fossil energy we purchase as a feedstock material. Allowance allocation will lessen—but not eliminate—fuel switching from coal to natural gas.

For these reasons, it is critically important that the underlying program be designed in ways that minimize the costs imposed on US manufacturers. For example, we think it would be better for the 2020 target to reflect a 14% reduction in GHG emissions from 2005 levels (the lower-bound end of the USCAP recommended range), rather than a 17% reduction. We believe the bill imposes too many procedural hurdles that will result in high-quality, legitimate offsets being excluded from the program. We would like to see incentives for more growth in US electricity generation from nuclear power over the timeframes contemplated in the bill.

Therefore, we will continue to work with Congress to ensure that the basic program design is further refined to address the competitiveness concerns of energy-intensive US manufacturers.

Conclusions

Dow strongly supports the framework developed by Representatives Inslee and Doyle to address competitive pressures facing energy-intensive, trade-exposed sectors of the economy. We re-iterate our belief that the set-aside of allowances be adequate to address this issue, and that these allowances not be phased-down before the competitiveness issue has been addressed.

Dow supports compensatory allowances for the use of fossil energy as a feedstock material, and we support the positive changes made by the Committee to this provision.

Dow believes that some of the allowance allocation provisions—the LDC allocation, and bonus allowances for CCS—will help to minimize fuel switching in the power sector, and will benefit US manufacturers who rely on natural gas.

Finally, we urge Congress to consider changes to other elements of the bill in order to maintain the competitiveness of energy-intensive US manufacturers.

Appendix—Dow's Progress and Commitment To Reduce Its Climate "Footprint"

Dow accepts the Intergovernmental Panel on Climate Change (IPCC) conclusion that it is very likely that human activities are causing global warming. We recognize the serious nature of the threat and that it warrants bold action.

We understand that it is not enough to agree with consensus scientific opinion. Our commitment to sustainability requires that we act upon such information responsibly. To that end, Dow has made considerable progress in reducing its climate "footprint":

- From 1995 to 2005, in keeping with its publicly announced sustainability goals, Dow reduced its energy intensity (BTU per pound of product) by 22%, resulting in energy saving of 900 trillion BTUs, which is enough to power all the homes in the entire state of California for a year.
- Since 1990, Dow reduced its absolute greenhouse gas (GHG) emissions since to a level that exceeds Kyoto targets. Overall, emissions of Kyoto GHGs were reduced by more than 20% during this time period.
- GHG emission reductions achieved through the use of Dow products more than offset the GHGs produced during the manufacture of those products.

Although this record is positive, we are committed to continued improvement and reduction of our environmental footprint. In order for Dow to contribute even more to climate change solutions, we have developed a clear vision and key milestones for the years 2015 and 2025. Our vision will guide our decisions today and into the future, and based on this vision, we pledge to reach a number of far-reaching objectives:

- Our vision is to have contributed to the achievement of a world in carbon equilibrium, a target described by Princeton University professors Robert Socolow and Stephen Pacala in the September 2006 edition of *Scientific American*. We will have set the industry benchmark through our own performance. We will apply our innovation and expertise to help solve the world's GHG and energy challenges.

- Our key milestones:

  - By 2015, Dow will reduce its energy intensity by another 25% compared to base year 2005.
  - By 2015, Dow will reduce its GHG emissions intensity (tons of CO_2 per pounds of production) 2.5% per year.
  - By 2025, Dow will stop the growth of absolute emissions of GHG within the company. Our absolute emissions will remain below the 1990 baseline, and we will begin on a journey of year-over-year reduction in GHG emissions.
  - By 2025, Dow aims to have non greenhouse gas emissive energy provide at least 400 MW equivalents, or 10% of Dow's global electrical demand.
  - By 2050, at least 50% of the energy consumed by Dow globally will be non-carbon emitting.

Mr. MARKEY. Thank you, Mr. Wells, very much.

Let me turn now to Mr. Terry to introduce our next witness.

Mr. TERRY. I am pleased I gave him a pretty good introduction for time allowed but I want to once again welcome and thank a good friend and constituent, David Sokol, CEO of Mid American Energy, who has great insight into the issues facing electrical generation. Thank you, David.

STATEMENT OF DAVID SOKOL

Mr. SOKOL. Thank you, Congressman. Thank you, Mr. Chairman. As the Congressman said, I am Dave Sokol, chairman of Mid American Energy Holdings Company, part of Berkshire Hathaway, and we have $41 billion in energy assets in 20 States and around the world, serving 7 million end-use customers. Our two domestic utilities service retail electric and natural gas customers in 10 States and our generation capacity consists of about 22 percent renewables, 48 percent coal, 24 percent natural gas and the remainder nuclear.

I want to be absolutely clear at the outset, cap and trade is two concepts. As we have consistently stated, the electricity sector can meet the interim and ultimate caps of reducing greenhouse gas emissions to 80 percent below 2005 levels by 2050. But the bill's trading mechanism will impose a huge and unacceptable double cost on our customers, first, to pay for emissions allowances, which will not reduce greenhouse gas emissions by one ounce, and then the construction of new low- and zero-carbon power plants and other actions that will actually do the job of reducing these emissions. This bill will cost hundreds of billions of dollars and we think it is wrong to saddle customers with these unnecessary and duplicative costs that provide them with absolutely no benefit. Some Congressmen claim that the cost of compliance with this bill will be zero or modest at worst. They are wrong, either because they have not read the bill or they have chosen to intentionally mislead the public on this topic. The cost impact of the allowance trading mechanism has been grossly understated for utilities with coal-fired generation. Under the allowance allocation formula, we calculate strictly pursuant to the bill that our 2012 allowance shortfall will be nearly 50 percent, not 10 percent. This represents 32.4 million allowances which at $25 per allowance will cost our customers in the first year alone $810 million. That would essentially create a tax between 12 and 28 percent in the States that we serve. That is just for the first year and a very conservative estimate of $25 per allowance, and as you know, some predict market prices to be two to four times higher. As the cap tightens and auctions increasingly replace free allocations, annual compliance costs will run into the tens of billions of dollars. But as they say, the devil is in the details so let us take a closer look at the bill.

In the first year, the bill creates 4.6 billion allowances, takes off 1 percent for strategic reserves and then gives the electricity sector a percentage that amounts to 2 billion allowances. Now, the sector's total greenhouse gas emissions in 2005 were 2.4 billion tons, so the 2 billion allowances constitute a 16.7 percent shortfall. The bill then gives an estimated 300 million allowances to merchant coal generators and other long-term power purchase agreements

which will therefore not be utilized for the benefit of customers and that leaves local distribution companies with about 1.7 billion allowances, a 30 percent cut below the sector's 2.4 billion tons of emissions, not a 10 percent cut.

But there are other cuts as well. For example, our two utilities have added about 2,000 megawatts of wind generation since 2004. We are the largest utility owner of wind generation in the United States. How does that bill treat our customers for their early action and willingness to move on climate change by adding wind and reducing carbon emissions? The bill penalizes them. And under your bill, utilities, the ones that actually need the allowances for compliance, will be forced to compete with Wall Street investment banks, hedge funds and speculators. Those folks don't generate electricity, they don't cut emissions but they do love volatility.

The bill's supporters also point to the SO_2 trading program as a successful template for this bill. Let us be clear: the only similarity between the SO_2 program and the Waxman bill is that they are both called cap and trade. The differences are huge. First, the SO_2 program applied only to the utility sector, not economy wide. Secondly, the volume of trading in the carbon market will be at least 300 times greater than the SO_2 market. Third, the SO_2 program, when it started, plant owners had choices. They could implement off-the-shelf available technology, switch to lower-sulfur fuels or buy allowances. Today there is no commercially available technology to capture and sequester carbon from coal and natural gas plants, and as you know, they produce 70 percent of our Nation's electricity. And fourth, 97 percent of the SO_2 allowances went to the utilities and were freely distributed over the life of that program, again, not the case here. And then lastly, the proceeds from the SO_2 auction were redistributed to the utilities to offset their cost of compliance, again, not so here with CO_2.

As we have said, the billions of dollars we pay for these allowances in this new market will not reduce our greenhouse gas emissions by one ounce. Only actions to actually meet emissions caps will do that. If your goal is to decarbonize the electric power sector, then you should keep the long-term caps but give States the option to bypass this trading mechanism by using their existing State and federal regulatory framework to determine the most efficient way to get there. This tackles the real problem, or at least the problem we thought, which was reducing greenhouse gas emissions, but it eliminates the costly and useless allowance trading. Is this still going to be expensive? Yes, but let us not make the consumer pay twice to reach these goals.

Thank you. I would be happy to take any questions.

[The prepared statement of Mr. Sokol follows:]

Testimony of David L. Sokol

Chairman, MidAmerican Energy Holdings Company

Subcommittee on Energy and Environment, Committee on Energy and Commerce

U.S. House of Representatives

June 9, 2009

Thank you, Mr. Chairman. I am David Sokol, Chairman of MidAmerican Energy Holdings Company, which has $41 billion in energy assets in 20 states and around the world serving 7 million end-use customers. Our two domestic utilities serve retail electric and natural gas customers in ten states, and our generation capacity mix consists of about 22% renewables (of which about half is wind), 48% coal, 24% natural gas, and the rest nuclear and other assets.

I. Caps, Not Trading

I want to be absolutely clear at the outset: Cap-and-trade is two concepts. The electricity sector can meet the Waxman-Markey interim and ultimate caps of reducing greenhouse gas emissions to 80% below 2005 levels by 2050, but the bill's trading mechanism will impose a huge and unacceptable double cost on customers: first to pay for emission allowances, which will not reduce greenhouse gas emissions by one ounce, and then for the construction of new low- and zero-carbon power plants and other actions that will actually do the job of reducing these emissions. This bill will cost hundreds of billions of dollars, and we think it is wrong to saddle customers with these unnecessary and duplicative costs that provide them with absolutely no benefits. We should work instead on an alternative mechanism that empowers state regulators to work with their utilities to comply with the emission caps but without the trading.

Let me begin by observing that the cost impact of the allowance trading mechanism has been grossly understated for utilities that serve their customers with coal-fueled generation. The bill's supporters say the electricity sector is responsible for 40% of all U.S. greenhouse gas emissions and will receive 35% of the free allowances, so the sector is only taking about a 10% haircut. That is not how the bill works.

We calculate that our 2012 allowance shortfall will be nearly 50% - not 10%. This represents 32.4 million allowances which, at $25 per allowance, would cost our customers over $800 million. That would essentially create a tax of between 12% and 28% in our states. That's just for the first year – and at a very conservative estimate of $25 per allowance; some predict market prices two to four times higher. As the cap tightens and auctions increasingly replace free allocations, annual compliance costs will run into the tens of billions of dollars. Attachments 1 and 2 to my testimony demonstrate this shortfall going out to 2050.

II. Role of the U.S. Environmental Protection Agency

Moreover, the bill delegates broad authority to the U.S. Environmental Protection Agency (EPA) to essentially revise the entire cap and allocation scheme, which effectively undercuts whatever regulatory certainty the bill may otherwise provide. For example:

- Section 721 sets forth the precise number of emission allowances that will be available in each year of the cap-and-trade program, but then also grants EPA the authority to adjust these numbers if certain criteria are met. Changes to the number of allowances issued each year would ripple throughout the implementation of the cap-and-trade program, affecting compliance costs, allowance allocation formulas, and other parts of the program.

- Section 739 gives the EPA substantial authority to review and revise virtually any part of the offsets program as part of its five-year reviews.
- Under Section 783, which provides for the allocation formulas and includes provisions regulating the use of allowances, the EPA is granted significant authority to adjust the allocation formulas and to determine how allocated allowances can be used, which again raises concerns over regulatory certainty, as it is not clear what will and will not be permissible with respect to the use of allowances.

III. Allowance Allocation Formula

As to the allocation allowance formula, I want to explain why I maintain that the electricity sector ends up with a shortfall of much more than 10% of its needed allowances:

- First, the methodology used for allocating electricity industry allowances is not based on total economy-wide U.S. emissions in 2005, which were 7.2 billion tons of CO_2 equivalent. See Section 721(c)(2)(A)(i). Using the 35% allocation figure that the bill's supporters tout, the electric industry should receive approximately 2.5 billion allowances.
- However, the bill uses a different allocation formula and draws electricity sector allowances *from the total pool for capped industries*. That's an important distinction.
- The 7.2 billion tons of CO_2 equivalent plays no role whatsoever in the bill. Instead, the bill, in the first year, creates 4.6 billion allowances and then takes off 1% for strategic reserves (Section 726(b)), leaving the electricity sector with 4.58 billion allowances. (The percentage for strategic reserves increases to 2% in 2020.)
- It then gives the sector an allocation of 43.75% of those 4.58 billion allowances, which amounts to just over 2 billion allowances (the exact number is 2,004,069,375) (See

Section 782(a)). Where that 43.75% allocation figure comes from is not clear from the bill.

- Now, according to the EPA, the electricity sector's total greenhouse gas emissions in 2005 were 2.4 billion tons (and under Section 722(b)(1) of the bill, one ton of greenhouse gas equivalent emissions equals one allowance), so the 2 billion allowances constitute a 16.7% shortfall below the sector's total emissions of 2.4 billion tons (allowances).
- That's not the end of the shortfall, though, because the bill then gives an estimated 300 million allowances to merchant coal generators and others with long-term power purchase agreements, allowances that will not benefit customers. (See Section 783(a)(2) (long-term contract generator) and (2)(3) (merchant coal generator).) We calculate that merchant coal will receive its full 10% maximum distribution from the 2 billion allowances allocated to the sector, which would be 200,406,938, and we estimate that generators with long-term power purchase agreements will receive approximately 100 million allowances, although there appears to be no cap on their allocation.
- Subtracting these 300 million allowances from the 2 billion figure leaves local distribution companies with about 1.7 billion allowances, which represents a 30% cut below the sector's 2.4 billion tons of emissions – not a 10% cut.
- Then Section 783(b)(3) allocates half of the 1.7 billion allowances to local distribution utilities based on retail sales, without regard as to whether the utility had any emissions. As a result, utilities such as ours that did have emissions receive only about half of the allowances we need to meet the 2012 target.

The effect of the bill on an average utility with coal-fueled plants is that it will begin the cap-and-trade program with a significant shortfall of allowances, and this dilemma is

exacerbated by other factors. For example, the underlying assumptions in the bill do not adequately incorporate increased demand for electricity that will have occurred by 2012. In addition, the percentage of allowances allocated to the electricity sector, which starts at 43.75% for 2012 and 2013, then declines – to 38.89% from 2014-2015, 35% from 2016-2025, and so on down to 7% in 2029, and zero thereafter. Moreover, the total number of emission allowances declines once other sectors are covered under the Act. Thus, the cap continues to decrease each year. See Section 721(e)(1).

IV. Penalty for Early Action

The bill makes other cuts in allowances as well. In fact, the allowance allocation formula actually penalizes utilities such as ours that have reduced their carbon emission intensity. For example, our two utilities have added about 2,000 megawatts of wind generation since 2004. We are the largest utility owners of wind generation in the country, and these assets have greatly reduced our carbon intensity. How does the bill treat our customers for this early action to add wind and reduce carbon emissions? It penalizes them. That wind generation lowers our historic emission rates, thus reducing our allowance allocations and forcing us to buy more allowances. Attachment 3 to my testimony demonstrates this shortfall. (The 50-50 formula between historic emissions and deliveries (retail sales) is spelled out in Sections 783(b)(2) (emissions) and (b)(3) (deliveries).) The allowance trading mechanism in this bill thus penalizes our customers for every kilowatt-hour produced by those wind generators. If the goal of the trading program is to incentivize generators to build low- and zero-emission power plants, it makes no sense whatsoever to penalize the customers of early movers who did exactly that – before the bill's enactment.

V. Double Payment by Customers

The billions of dollars we will pay for these allowances in this new market will not reduce our greenhouse gas emissions by one ounce. Only actions to meet emission caps will do that. For regulated utilities, those actions will be not be developed and reviewed at the federal level but rather at the state level. Thus, regulated utilities will still have to work with their state regulators to identify the new measures and replacement generation that will be needed to actually achieve any real reductions. And that's the ultimate flaw of this bill. It will require consumers to pay twice: once for the cost of the federal allowances purchased by their utilities in the new carbon market and again for the cost of actions by utilities at the state level that will actually reduce greenhouse gas emissions.

VI. Market Monitoring

What about market abuses? Under your bill, utilities – the ones that actually need the allowances for compliance – will be forced to compete with Wall Street investment banks, hedge funds and speculators. As Section 724(b) makes absolutely clear, the "privilege of purchasing, holding, selling, exchanging, transferring, and requesting retirement of emission allowances, compensatory allowances, or offset credits shall not be restricted to the owners and operators of covered entities, except as otherwise provided in this title." Those folks do not generate electricity and do not have to cut emissions; they make profits. Let's face it: If we have learned anything from securitized mortgage trading and credit default swaps, it is that market regulation has not prevented abuses, no matter how aggressive the oversight.

VII. Clean Air Act Acid Rain Sulfur Dioxide Cap-and-Trade Program

The bill's supporters also point to the Clean Air Act acid rain SO_2 trading program as a successful template for this bill. Let me draw some sharp distinctions between the two:

- First, the SO_2 program applied only to the utility sector, not economy-wide.
- Second, the potential volume of trading in the carbon market will be at least 300 times greater than the SO_2 market, dwarfing that smaller market. For example, since 2007, the average annual volume of SO_2 allowances traded for spot and future vintages was approximately 15 million allowances per year. This is equivalent to roughly twice the 2008 level of SO_2 emissions under the acid rain program of 7.6 million tons. Compare those annual SO_2 figures to the volume expected under a carbon trading scenario, where the average daily CO_2 emissions are approximately 6.5 million tons from the electricity sector alone, or 2.4 billion tons per year.
- Third, off-the-shelf technology was already available to reduce SO_2 emissions when the program started, so plant owners had choices. They could buy the technology, switch to lower sulfur fuels, or buy allowances. For example, lower sulfur coal, which was readily available from parts of Appalachia, the Illinois Basin, and the Powder River Basin in Wyoming, now helps keep compliance costs at a reasonable level. Conversely, with carbon dioxide, there is no similar "low carbon" fossil fuel to achieve the Waxman-Markey bill's 83% carbon dioxide emission reduction. Even if all of the coal-fueled units are converted to natural gas (a much higher cost fuel), the 83% target would still not be close to being achieved. Sulfur dioxide scrubbing technology was also commercially available at the time the Clean Air Act was promulgated. Today there is no commercially available technology to capture and sequester carbon from coal and natural gas plants,

which produce 70% of our nation's electricity, so buying allowances (or offsets, if available) is the only short-term answer, because carbon capture and sequestration technology is not expected to be commercially available for at least a decade or longer. In short, SO_2 emission reductions did not require replacing the vast majority of existing energy infrastructure with new infrastructure in a relatively short time frame. Addressing climate change will require massive new infrastructure and very significant technological innovation.

- Fourth, the goal of the Clean Air Act acid rain program was a 50% reduction in sulfur dioxide emissions, not an 83% reduction.
- Fifth, 97% of the SO_2 allowances went to the utilities and are freely distributed over the life of the program. That is not the case here.
- Sixth, the proceeds from the auction get redistributed to the utilities with the compliance obligations. That is not the case here.
- Lastly, the SO_2 allowances went to the utilities that needed them. Here, utilities with significant nuclear and hydro resources will receive billions of allowances they don't need for compliance.
- In summary, under the acid rain program, if a utility met its emission reduction target, it held a sufficient quantity of allowances necessary for compliance. Under Waxman-Markey, a utility with coal-fueled resources could meet its emission reduction target and still be required to purchase millions of allowances.

VIII. Allocation of Allowances

As I have said, this bill's trading mechanism will impose an added cost on customers that will not reduce greenhouse gas emissions, so MidAmerican opposes the trading approach in its entirety. However, assuming that the bill only permits allowance trading and not less costly, more efficient alternatives, it should at least allocate allowances in an equitable way that is best designed to provide the incentives needed to reduce greenhouse gas emissions. Allocations based purely on retail sales will create a financial windfall for predominately hydro and nuclear resourced utilities because they will receive a disproportionate free allowance allocation compared to their actual need. For this reason, any retail sales allocation should be limited to retail sales derived from emitting resources. The California Public Utilities Commission (CPUC) and the California Energy Commission (CEC), which have held many hearings and workshops on the implementation of California's own global warming legislation (A.B. 32), have come to the same conclusion, recommending:

> With a fuel-differentiated output-based allocation, allowances would be allocated only to deliverers of electricity from emitting resources, using weighting factors based on fuel type ... the use of weighting factors would reduce, and could largely eliminate, wealth transfers from customers of coal-dependent retail providers to customers of natural gas dependent retail providers. This reduction of wealth transfers would be accomplished by providing emitting deliveries with allocations that more closely reflect their emission levels. CPUC-CEC Final Opinion on Greenhouse Gas Regulatory Strategies (October 16, 2008) (CPUC Rulemaking 06-04-009) (CEC Docket 07-OIIP-01) ("CPUC-CEC Final Opinion") at 158. See http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/92591.pdf

Utilities that built hydroelectric dams many decades ago or nuclear plants in the 1960's and 1970's did not do so in order to avoid greenhouse gas emissions. These zero-emitting resources do not bear the burden or the direct costs of effectuating greenhouse gas emissions

reductions. Therefore, there is no reason to provide them with a financial windfall. As the California regulatory staff note, "...nuclear, hydro, and renewable sources...do not need [free allowances]." CPUC-CEC Final Opinion at 159.

To take just one example, according to data voluntarily filed with the California Climate Action Registry, Seattle City Light emitted 77,333 metric tons of CO_2 in 2007 (average emissions rate for retail electricity of 17.77 lbs CO_2 per megawatt hour multiplied by 9,594,301 megawatt hours of retail sales). Under the Waxman-Markey "local distribution company/retail sales" budget, Seattle City Light can expect to receive approximately 2,250,000 free allowances in 2012, which is more than 29 times the number of allowances it will need for compliance. Assuming $25 per allowance, that represents a windfall of over $54 million in 2012 alone. And this is only part of the free allowances Seattle City Light will receive, because it is eligible to receive additional allowances from the "local distribution company/emissions adjusted retail sales" bucket.

While MidAmerican prefers a more traditional, "historical emissions" allowance allocation to generators method, we agree with the CPUC-CEC observation that allowance distributions based on historical emissions would place new utilities and fossil generators "at a competitive disadvantage unless appropriate allowance set-asides were established for them." CPUC-CEC Final Opinion at 203.

To overcome this shortcoming, and to address concerns about windfall profits and wealth transfers among utilities, MidAmerican's subsidiary PacifiCorp supported the California decision to recommend a fuel-differentiated output-based distribution method, specifically because, as the CPUC-CEC's Final Opinion noted:

> Fuel-differentiated output-based distributions to deliverers of electricity from emitting generation resources (including unspecified sources) would

> perform similarly to historical emissions-based distributions to deliverers in terms of minimizing wealth transfers based on the emissions characteristics of the retail providers' portfolios. There would still be distributional variations based on the degree of the retail providers' reliance on market purchases. On the other hand, a pure output-based distribution would provide allowance rents to independent deliverers of zero- and low-emission electricity, including those under contract to retail providers. This would result in wealth transfers from customers of retail providers with relatively high-emitting portfolios to customers of retail providers with relatively low-emitting portfolios. Limiting output-based distributions to only deliverers of electricity from emitting generation resources would moderate the allowance rents and resulting wealth transfers. CPUC-CEC Final Opinion at 200-201.

A more equitable way to achieve the goal of significant greenhouse gas emission reductions is to distribute allowances linked either to a historical emissions or a fuel-differentiated output-based distribution method. If not, hydro- and nuclear-dependent local distribution companies, flush with allowances based upon retail electricity derived from non-emitting resources, will receive allowance windfalls and, when auctioned, allowance revenue windfalls. These utilities will thus have less incentive to cut existing or avoid future greenhouse gas emissions than coal-dependent utilities because with the surplus allowances, they will have the wherewithal to actually increase their emissions at no cost.

The distribution of allowances based upon retail sales and linked to either historical emissions or a fuel-differentiated output-based distribution methodology provides a stronger incentive to reduce carbon emissions, rewards early action once the program starts, and avoids windfall profits and wealth transfers between utilities and from state-to-state As you can see from Attachments 4 and 5 to my testimony, the significant regional differences regarding fuel mixes will essentially result in a wealth transfer from Midwestern and Interior Western states, which rely heavily on coal, to states in the Northeast, Northwest, and California (which generates 1% of its electricity from coal).

IX. MidAmerican's Proposed Alternative Compliance Mechanism

If de-carbonizing the electric power sector is the goal, then Congress should consider an alternative compliance mechanism: Retain the long-term targets but give states the option to bypass the trading by using their existing regulatory framework to determine the most efficient ways to get there. This is a less expensive, more effective enforcement mechanism for regulated utilities that is already in place in the states.

Owners and users of electric generation need clear, certain and predictable rules, regulations and incentives in order to make sound long-term and least-cost decisions to implement legislation to reduce CO_2 emissions. Electric generators should be offered an alternative compliance mechanism that does not involve speculation, trading, and the exchange of billions (or perhaps trillions) of dollars. The focus of electric generation planning should be long-term price stability, not long-term price volatility.

Our proposed optional enforcement mechanism recognizes that this bill does not specify a pathway for achieving emissions reductions. For utilities, that pathway will be developed through the existing state regulatory process. This state regulatory enforcement mechanism is already in place, has worked for more than a century, and does not depend upon the vagaries of a new market. Most importantly, the states will need to use this regulatory mechanism even if Congress creates an allowance trading market. States should be given the option to enforce the caps for utilities by using their existing regulatory mechanisms without being required to involuntarily participate in the trading market.

I have attached draft language for MidAmerican's proposed alternative compliance mechanism as Attachment 6 to my testimony. This alternative compliance plan amendment retains the same greenhouse gas emissions caps for 2020, 2030 and 2050 as the Waxman-

Markey bill, but it eliminates the need for customers to pay twice. It accomplishes this by allowing a state to choose to have its regulated utilities avoid the costs of the trading market and work directly with the state regulators to meet the caps – which the regulated utilities would have to do anyway.

There is nothing novel about the alternative approach in the proposed amendment. In fact, the amendment proposes the same approach for implementing and enforcing the emissions cap that is used in other federal environmental laws and that has been used in utility regulation for more than a century. That is, Congress or state legislatures enact a legal requirement and then state regulators, regulated companies, interested parties, and experts determine the most efficient way to meet the requirement. For example, the Clean Air Act directs states to submit a State Implementation Plan, or SIP, identifying the regulatory action to be undertaken to meet the federal requirement under the Act.

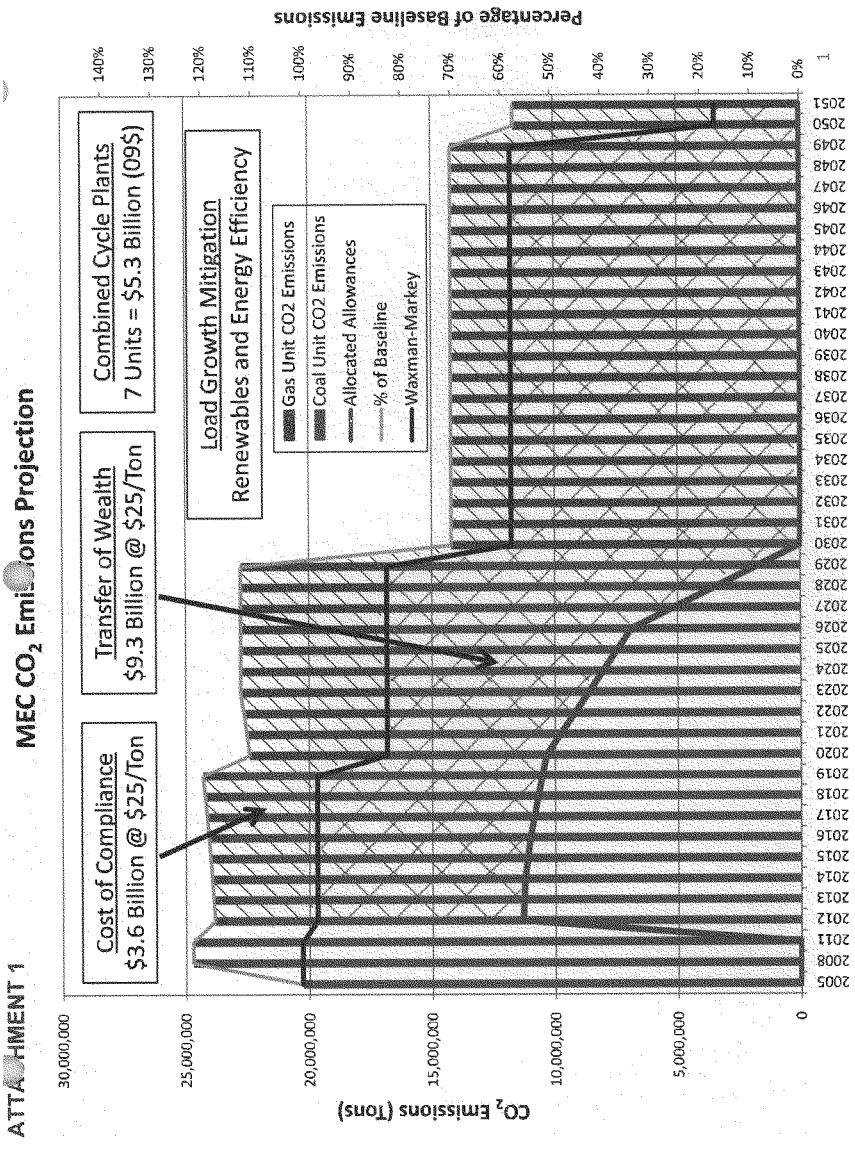
Key aspects of our alternative compliance plan amendment include:

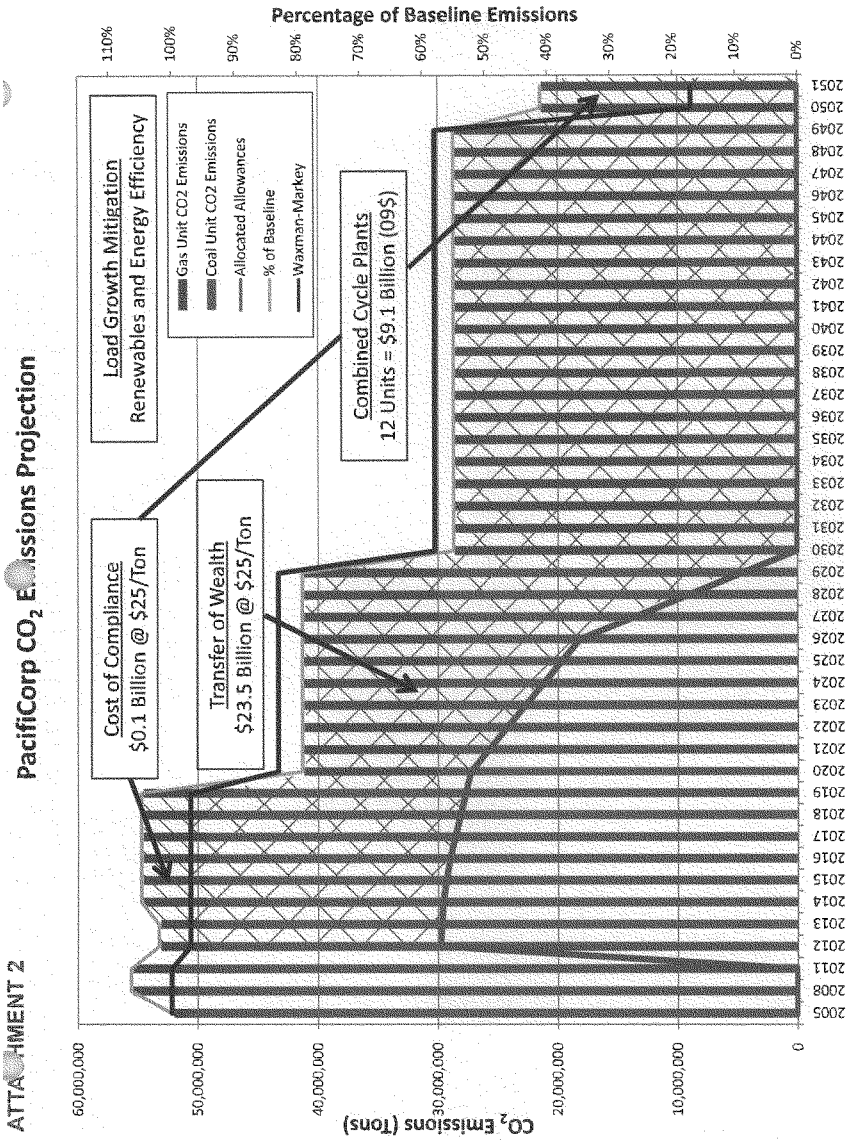
- States, not utilities, determine whether to participate in the trading market or to use the alternative compliance approach; the determination requires legislative action approved by the governor because the entire state will be impacted by this decision.
- To protect consumers, only electric utilities whose rates are regulated by the state can qualify for the alternative compliance approach.
- Utilities must meet the same 2020, 2030 and 2050 caps whether the state chooses the market trading approach or the compliance alternative offered by the amendment.
- The same penalties apply for non-compliance.
- Alternative compliance plans must contain details of the measures that will be undertaken to ensure compliance with the caps.

- Alternative compliance plans must be updated at least every four years.
- Alternative compliance plans adopted by the state must be filed with the state and federal environmental agencies that enforce the Clean Air Act amendments.
- Utilities that are subject to alternative compliance plans receive no free allowances.
- Utilities that serve more than one state can be subject to an alternative compliance plan in one state and to the trading market in another state.

MidAmerican's alternative compliance amendment gives states an option to avoid the auctions, speculation, trading, new Wall Street products, and the billions of dollars in government revenue that may end up being spent on other programs. Instead, states can choose to focus upon pursuing the most efficient ways of reducing greenhouse gas emissions to meet the federal caps, while at the same time protecting their citizens. This tackles the real problem – reducing greenhouse gas emissions – but eliminates costly and useless allowance trading. This low-carbon performance standard would affect existing plants as well as well as new ones. Is this going to be expensive? Yes, but let's not make consumers pay twice to reach these goals.

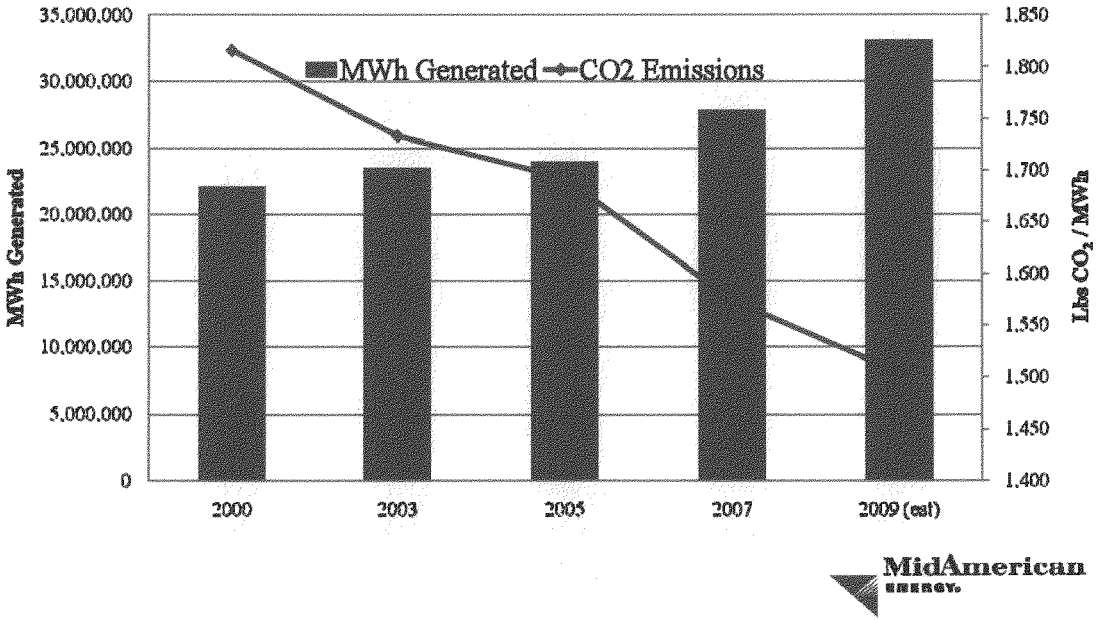
Thank you. I would be pleased to answer any questions.


ATTACHMENT 1
MEC CO_2 Emissions Projection
Cost of Compliance
$3.6 Billion @ $25/Ton
Transfer of Wealth
$9.3 Billion @ $25/Ton
Load Growth Mitigation
Renewables and Energy Efficiency
Combined Cycle Plants
7 Units = $5.3 Billion (09$)
Gas Unit CO2 Emissions
Coal Unit CO2 Emissions
Allocated Allowances
% of Baseline
Waxman-Markey
CO_2 Emissions (Tons)
Percentage of Baseline Emissions


ATTACHMENT 2
PacifiCorp CO_2 Emissions Projection
Percentage of Baseline Emissions
CO_2 Emissions (Tons)
Load Growth Mitigation
Renewables and Energy Efficiency
Cost of Compliance
$0.1 Billion @ $25/Ton
Transfer of Wealth
$23.5 Billion @ $25/Ton
Combined Cycle Plants
12 Units = $9.1 Billion (09$)
Gas Unit CO2 Emissions
Coal Unit CO2 Emissions
Allocated Allowances
% of Baseline
Waxman-Markey

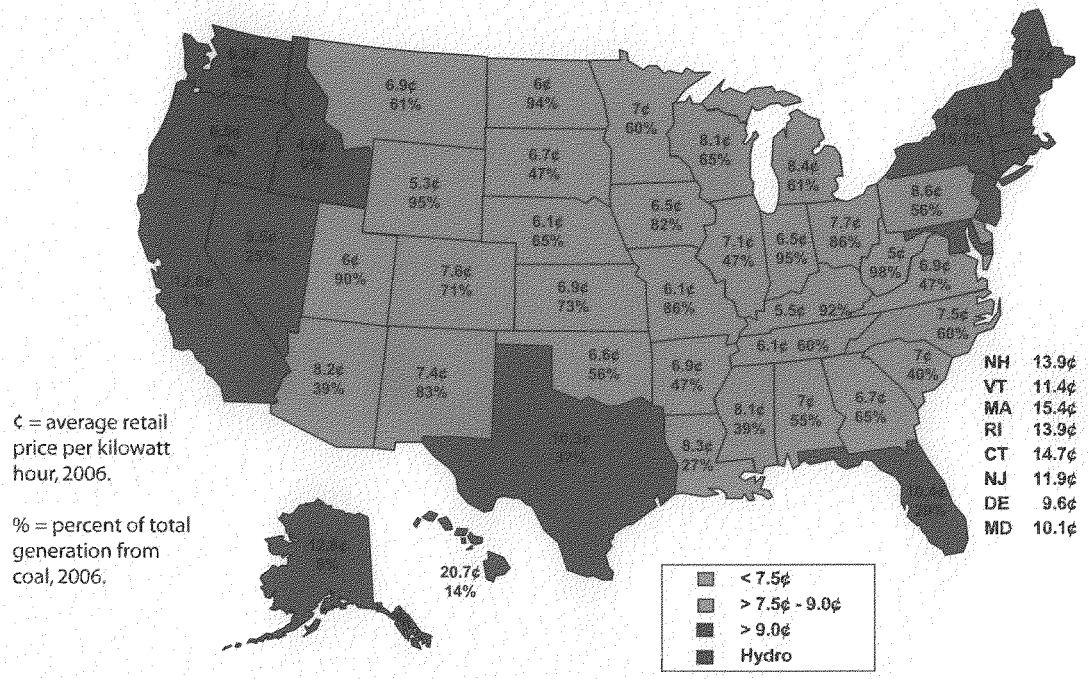
ATTACHMENT 3

MidAmerican's Wind Benefit
Decreasing Carbon Footprint



ATTACHMENT 4

Cost per kWh and Percent Generated by Coal



¢ = average retail price per kilowatt hour, 2006.

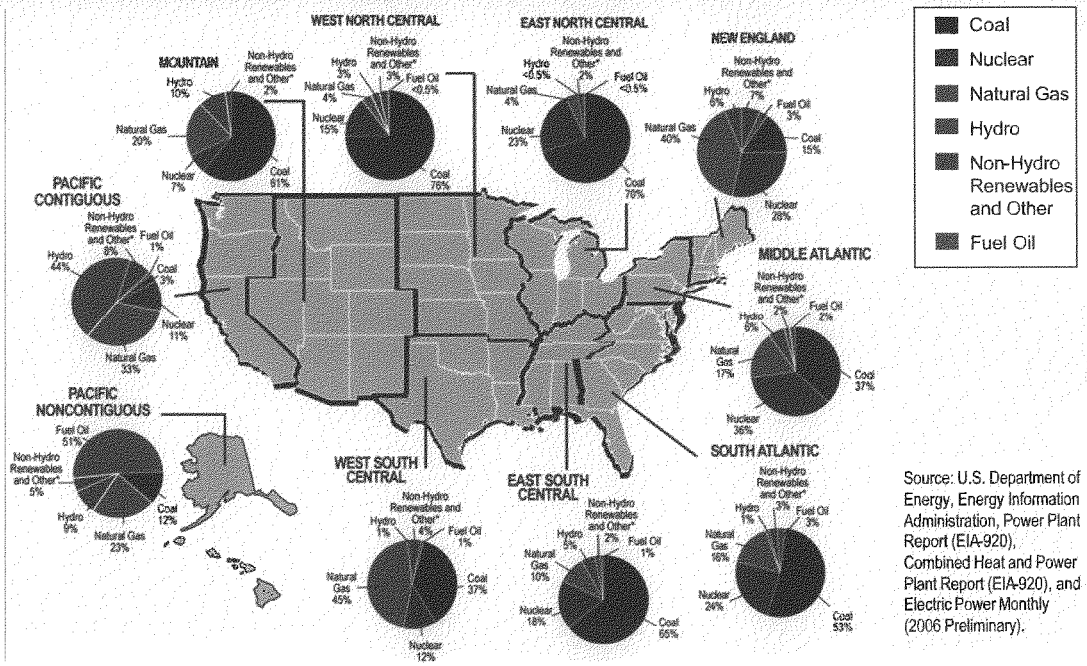
% = percent of total generation from coal, 2006.

NH	13.9¢	17%
VT	11.4¢	0%
MA	15.4¢	25%
RI	13.9¢	0%
CT	14.7¢	12%
NJ	11.9¢	18%
DE	9.6¢	69%
MD	10.1¢	60%

Source: Energy Information Administration, March 2007.

ATTACHMENT 5

Different Regions of the Country Use Different Fuel Mixes to Generate Electricity



Source: U.S. Department of Energy, Energy Information Administration, Power Plant Report (EIA-920), Combined Heat and Power Plant Report (EIA-920), and Electric Power Monthly (2006 Preliminary).

H.R. 2454 Draft Amendment
Alternative Compliance

ATTACHMENT 6

"SEC. XXX.—ALTERNATIVE COMPLIANCE MECHANISM.

"(a) IN GENERAL.—Title VII of the Clean Air Act (as added by section 331 of this Act) is amended by adding the following new part after Part F:

"PART G—ALTERNATIVE COMPLIANCE MECHANISM FOR RATE-REGULATED ELECTRIC UTILITIES

"SEC. 871. CERTIFICATION TO CONGRESS.

"(a) DEFINITIONS.—For purposes of this part:

"(1) The term 'rate-regulated retail electric supplier' means an electric utility that sold not less than 4,000,000 megawatt hours of electric energy to electric consumers for purposes other than resale during the calendar year prior to the enactment of this Act pursuant to rates that are subject to review and acceptance by regulatory authorities in one or more states.

"(b) STATE CERTIFICATION.—

"(1) Not later than 1 year after the date of enactment of this Act, each State shall certify to the Administrator of the Environmental Protection Agency, by legislative act effective upon signature of the governor, which of the rate-regulated retail electric suppliers providing retail electric service within that State shall meet the requirements of Title VII of this Act through the program established in Part C of Title VII of this Act and which shall meet the requirements through a state alternative compliance plan developed under section 872.

"(2) If a State certifies that one or more of the rate-regulated retail electric suppliers providing retail electric service within that State will be subject to an alternative compliance plan, the State is authorized to implement and enforce the requirements of Title VII of this Act through a state alternative compliance plan developed under section 872.

"(3) A rate-regulated retail electric supplier that complies with a State's alternative compliance plan developed under section 872 shall be deemed to be in compliance with any requirements under Title VII of this Act, excluding any reporting requirements under section 713.

"(c) PENALTIES FOR NON-COMPLIANCE.—

"The penalty for noncompliance described in section 723 shall apply to a State's failure to comply with its alternative compliance plan; provided that a certifying

State may seek to recover the costs of the penalty for non-compliance described in section 723 from the rate-regulated retail electric supplier covered by the alternative compliance plan if the certifying State determines that the cause of non-compliance was the direct result of an action or inaction by such rate-regulated retail electric supplier.

"SEC. 872. STATE ALTERNATIVE COMPLIANCE PLANS

"(a) REQUIREMENTS.—Within 1 year after the date of submitting the certification under section 871(b)(1) of this Part, the State agency responsible for regulating the electric rates of the rate-regulated retail electric supplier shall adopt an alternative compliance plan for each rate-regulated retail electric supplier which has been identified as being subject to a plan. The State shall promulgate any laws or regulations necessary to provide for the implementation, maintenance, and enforcement of the requirements described in this section.

"(b) CONTENTS OF ALTERNATIVE COMPLIANCE PLANS.— Each alternative compliance plan of a State shall—

"(1) identify the rate-regulated retail electric supplier providing retail electric service within that State that will be subject to the alternative compliance plan;

"(2) determine the quantity of greenhouse gas emissions attributable to the retail electric service provided within the State by the rate-regulated retail electric supplier in 2005;

"(3) require that, if the rate-regulated retail electric supplier owns or operates a covered EGU within the State as defined in section 116 of Title I of this Act, the covered EGU must meet the performance standards established by that section; and

"(4) set forth in detail the measures that will be required to be undertaken by the rate-regulated retail electric supplier to satisfy the emissions reduction targets for 2020, 2030 and 2050 of Sections 703 of Part A of Title VII of this Act for the proportion of its total emissions that are subject to regulation by the State adopting the alternative compliance plan.

"(c) REGIONAL CAP AND TRADE PROGRAMS PROHIBITED -- Participation in a regional cap and trade program or comparable program shall not be deemed a permissible measure under subsection (b)(4).

"(d) UPDATES TO PLANS.-- Alternative compliance plans shall be updated by the State at least every four years.

"(e) FILING OF PLANS.--

"(1) Within thirty days after adoption by the State agency responsible for regulating the electric rates of the rate-regulated retail electric supplier, an alternative compliance plan or update shall be filed with the State environmental agency delegated enforcement authority of U.S. Code Title 42, Chapter 85.

"(2) The State environmental agency delegated enforcement authority of U.S. Code Title 42, Section 7410 shall file the alternative compliance plan or update with Administrator of the Environmental Protection Agency as a State Implementation Plan control measure.

"(f) ALLOCATION OF ALLOWANCES— A rate-regulated retail electric supplier that is subject to a state alternative compliance plan under this section shall not receive allowances under Part C of Title VII this Act for the proportion of its total emissions and retail sales that are subject to regulation by the State adopting the alternative compliance plan. Except as provided in this section, a rate-regulated retail electric supplier subject to an adopted alternative compliance plan shall not be subject to the provisions and rules of Part C.

"(g) OFFSETS -- In addition to other measures to satisfy the emissions reduction requirements under subsection (b)(4), a rate-regulated retail electric supplier that is subject to a state alternative compliance plan under this section shall be authorized to receive offset credits under Part D of Title VII of this Act as follows:

"(1) Offset credits under Section 732 for over-compliance for federal renewable energy credits issued pursuant to Title I of this Act and tendered by the owner of such credits to the extent the credits have not been submitted to comply with the annual compliance obligation under Title I, Section 101(b) of this Act or otherwise retired pursuant to a federal program;

"(2) Offset credits under Section 732 for over-compliance for total annual electricity savings as defined in Title I, Section 101(a) of this Act to the extent the total annual electricity savings have not been submitted to comply with the annual compliance obligation under Title I, Section 101(b) of this Act;

"(3) Offset credits under Section 740 for early action for megawatt hours of renewable energy that would have qualified for issuance of federal renewable electricity credits pursuant to Title I of this Act but for the fact that the energy production occurred after January 1, 2005 but prior to December 31, 2011; and

"(4) Offset credits under Section 740 for early action for megawatt hours of electricity savings between January 1, 2005 and December 31, 2011 that would have qualified as total annual electricity savings as defined in Title I, Section 101(a) of this Act but for the fact that the measures were placed into service prior to the enactment of Title I.

H.R. 2454 Draft Amendment
Alternative Compliance

"(h) PUBLIC-PRIVATE COLLABORATION.— A rate-regulated retail electric supplier that is subject to a state alternative compliance plan under this section shall collaborate with the State agency responsible for regulating the electric rates of the rate-regulated retail electric supplier to develop a long-term integrated resource plan designed to ensure compliance with the requirements of this section.

"(i) APPLICABILITY OF CLEAN AIR ACT PROVISIONS --

"(1) A rate-regulated retail electric supplier that is subject to a state alternative compliance plan under this section shall not be subject to the following provisions of the U.S. Code as long as the plants remain in compliance with the state's alternative compliance plan: Title 42, Sections 7411, 7412, 7413, and 7470 through 7479.

"(2) The exemptions in Part C of Title VIII of this Act shall apply to a rate-regulated retail electric supplier that is subject to a state alternative compliance plan under this section.

Mr. MARKEY. Our next witness is Mr. Steve Cousins, the vice president of refining for Lion Oil and chairman of the National Petrochemical and Refiners Association Manufacturing Committee. We welcome you, sir.

STATEMENT OF STEVE COUSINS

Mr. COUSINS. Thank you, Chairman Markey, Ranking Member Upton and members of the subcommittee. My name is Steve Cousins. I am the vice president of refining for Lion Oil Company. My training is as a chemical engineer and I have spent my 31-year professional career at our El Dorado, Arkansas, refinery, which has been in operation for 85 years. Our refinery produces approximately 70,000 barrels per day and our main products are gasoline, diesel fuel and asphalt. We employ 1,200 people directly at our unionized El Dorado facility and there are approximately 3,600 other individuals that dependent indirectly on our plant for their livelihoods, and like many in the audience here today, we wear hardhats to work too. We aren't Big Oil. We are a small rural oil refiner.

The subject of this hearing is extremely important to Lion Oil. In our opinion, the proposed allocation of allowances will result in the shuttering of our refinery and the loss of the 1,200 jobs we have worked for decades to bring to and sustain in southern Arkansas. If Congress includes transportation fuels in a cap-and-trade program and makes refiners hold allowances for those products, it must provide the industry with a fair and equitable allowance allocation.

According to EPA's best estimates, the combined carbon dioxide emissions for domestic petroleum refineries and the consumer combustion of refined products constitute approximately 35 percent of the Nation's current CO_2 emissions. These emissions also represent 52 percent of the legislation's total emissions allowance pool, and yet the bill, as currently drafted, only provides our industry with 2 percent of the CO_2 emissions allowances. Compare that a proposed allocation to other industries. Electric generators will receive allocations for 90 percent of their CO_2 emissions. So-called energy-intensive industries will receive allocations for 100 percent of their CO_2 emissions. And remarkably, domestic auto manufacturers which are not responsible for the CO_2 emissions from their vehicles at all will also receive a larger allocation for CO_2 emissions than refiners.

Simply stated, American refiners like our business are dramatically shortchanged in this bill. I am not an economist but I strongly believe that if the bill's current allocations stand, the impact on Lion Oil will be profound. At a cost of $20 a ton, Lion Oil will have to spend $180 million a year to purchase allowances in the first years of the cap-and-trade program just to cover our obligation for consumer emissions for fuels. Further into the program, our company could be forced to spend $750 million by the year 2030 and nearly $2 billion a year by the year 2050. Over the last 23 years, Lion Oil's actual average net profits have been $13 million per year. It is not hyperbole to say that the addition of $180 million per year to the operating costs of a refinery that averages $13 million a year in profit will make our survival impossible. We cannot

offset these large carbon costly profits from other lines of business. We don't have gasoline stations, we don't have oil wells. Lion is a small, independent refiner. We are not a big oil company. Our operation has to pay for itself or the plant cannot continue to operate. In short, without a fair and equitable allowance allocation, our company will be unprofitable in year one and insolvent within a matter of months, not years.

Proponents of this bill suggest that we will simply pass the compliance costs through to consumers in the form of higher retail pump prices for gasoline and diesel. Even assuming that 90 percent of the carbon costs could be passed through, the remaining 10 percent, or $18 million per year, is still 150 percent of our annual profit. No company can survive those kind of negative financial results for long.

Foreign refiners already have a competitive advantage over American businesses. This bill would effectively outsource our energy future and eliminate hundreds of thousands of American jobs in our industry as well as those in companies that rely on our industry. There is a new refinery in India and it is already expanding to over 1 million barrels per day. It is not designed to sell any product in India, it is designed to sell its product in the United States and Europe. They don't have to meet the U.S. EPA standards. They don't have to meet U.S. OSHA standards. They don't have to compensate for their onsite CO_2 emissions. They would be more than happy to take the place of Lion Oil and 15 other small refiners in this country.

In closing, I would simply stress that this legislation should not be passed in its current form to protect the quality jobs we provide, to protect consumers, farmers and truckers that we supply from higher gasoline and diesel fuel prices.

I appreciate the opportunity to appear before you today. I look forward to any questions you may have.

[The prepared statement of Mr. Cousins follows:]

TESTIMONY OF STEVE COUSINS

VICE PRESIDENT, LION OIL COMPANY

EL DORADO, ARKANSAS

BEFORE THE

HOUSE ENERGY AND COMMERCE COMMITTEE'S

SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

HEARING ON

"ALLOWANCE ALLOCATION POLICIES IN CLIMATE LEGISLATION:

ASSISTING CONSUMERS, INVESTING IN A CLEAN ENERGY FUTURE,

AND ADAPTING TO CLIMATE CHANGE"

June 9, 2009

Chairman Markey, Ranking Member Upton and Members of the Subcommittee, my name is Steve Cousins and I am the Vice President of Refining for Lion Oil Company. My training is as a chemical engineer and I have spent my 31 year professional career at Lion Oil.

Lion Oil is headquartered in El Dorado, Arkansas and has been in operation for over 85 years. Our refinery produces approximately 70,000 barrels per day and our main products are gasoline, diesel fuel and asphalt. We sell to customers throughout a five state region surrounding Arkansas which results in employment of 1,200 direct employees in our unionized El Dorado facility and approximately 3,600 other individuals that depend indirectly on Lion's plant for their livelihoods. Lion Oil is a leading economic engine in Southeastern Arkansas.

Thank you for inviting me to testify. The subject of this hearing – the allocation of CO2 allowances under the cap and trade legislation which passed in the House Energy and Commerce

Committee on May 21st – is extremely important to me and Lion Oil. My fundamental message to this Subcommittee today is very simple and very direct. From Lion Oil's point of view, the proposed allocation of allowances under ACES – if not changed dramatically between now and enactment into law – will result in the shuttering of our refinery and the destruction of the 1,200 jobs that we have worked for decades to bring to Southeastern Arkansas.

I would first like to note that including fuels in a cap and trade program is redundant and unnecessary. In 2007, Congress passed and the President signed into law the Energy Independence and Security Act, or EISA. This legislation already requires refiners blend 36 billion gallons of renewable fuels into the nation's fuel supply by 2022. These fuels have to meet specific carbon reduction targets and come at a significant cost to refiners and consumers. In addition to the biofuels requirements, EISA also increased CAFÉ standards, requiring auto makers to achieve a fleetwide average of 35 miles per gallon by 2020. Furthermore, the Obama Administration recently announced that EPA and DOT will start working on a nationwide greenhouse gas tailpipe standard. With all these initiatives underway, it is not necessary to impose further regulations on transportation fuels and consumers in a CO2 cap and trade bill.

If Congress insists on including transportation fuels in a cap and trade program and making refiners hold allowances for those products, it must provide the industry with a fair and equitable allowance allocation. According to EPA's best estimates, the combined CO2 emissions from domestic petroleum refineries and the combustion from customers of these products constitute approximately 35 percent of the nation's current CO2 inventory. These emissions also represent approximately 52 percent of ACES' total emissions allowance pool in 2014. And yet, the bill as currently drafted only provides our industry with two percent of the CO2 emissions allowances during the early years of the cap and trade program. In other words,

ACES would force the domestic refining industry to purchase over 90 percent of the allowances it would need for compliance with the legislation.

Compare that proposed allocation to other industries under the bill. Electricity generators would receive allocations for 90 percent of their CO2 emissions. So-called "energy intensive industries," would receive allocations for 100 percent of their CO2 emissions. And remarkably, domestic auto manufacturers – who in fact are not responsible for CO2 emissions at all under the bill – would receive three percent of the CO2 allocations under the bill.

Stated simply, domestic petroleum refiners like Lion Oil are short-changed dramatically in this legislation. While I respect the position of the Chairman and the proponents of this bill, the fact is that petroleum will continue to be the primary transportation fuel for this country for the next several decades, and therefore, the current allocation formula must be changed drastically.

I am not an economist, an academic or a consultant. I run a petroleum refinery. But I strongly believe that if the bill's current allocations stand, the impact on Lion Oil will be profound. It is estimated that our refinery and the fuels we produce there emit 10 million metric tons of CO2 each year. Therefore, under this bill's mandates we will have to purchase on the open market 9 million CO2 allowances annually. If it is assumed that those allowances will cost $20.00 per ton (which likely underestimates the actual costs), Lion Oil will have to spend $180 million a year to purchase allowances in the first years of the cap and trade program under this bill. In the later years of the program, some estimates indicate our company could be forced to spend approximately $750 million in 2030 and nearly $2 billion in 2050.

Lion Oil is not a company that can offset such costs through profits from other lines of business, such as upstream oil production or retail. Lion is a pure play independent refiner. Our

refining operation has to pay for itself or the plant cannot continue to operate. In short, without a fair and equitable allowance allocation, our company will be unprofitable in year one and insolvent within a matter of months, not years.

A quick comparison of our net profits to the cost of allowances should make it clear that we cannot absorb even a relatively small portion of the costs of compliance and remain a viable company. Over the last 23 years, Lion Oil's average annual net profits have been $13 million per year. It is not hyperbole to say that the addition of $180 million per year to the operating costs of a refinery that averages $13 million per year in net profits will make our survival impossible.

The proponents of this bill counter that I am wrong and that Lion Oil will simply pass these compliance costs through to consumers in the form of higher retail pump prices for gasoline and diesel fuel. This argument reveals a fundamental disconnect between academic economics and the real world in which I and my company operate. To put it bluntly, proponents of such "pass through" concepts are wrong.

Let me give you a brief example of why they are wrong and why markets pure play – driven by millions of consumer choices, not just costs – set the price of gasoline and diesel fuel on the street. Between 2005 and the summer of 2008, the price of crude oil rose 231 percent, while the price of gasoline on the street rose only 122 percent. If refiners like Lion Oil are able to "pass through" the brunt of our increased crude oil costs to our customers, don't you think we would have done so during this period?

Even if it is assumed 90 percent of carbon costs can be passed through – an extremely tenuous assumption – for my company, the remaining ten percent – $18 million dollar per year in

compliance costs – represents almost 150 percent of our annual net profit. No company, including ours, can survive such negative financial results for long.

In the real world, this bill's treatment of domestic refiners with respect to allocation of allowances is simply a thinly-veiled attack on crude oil as an energy source and domestic refiners as a provider of energy to consumers, farmers and truckers.

The Members of this Subcommittee, and the American consumers, should care about this attack and should fight back against it for several reasons. First, even if the rosiest projections for the development of renewable and alternative transportation fuels are accurate, petroleum will continue to be the dominant form of energy for transportation for the next two or three decades. Second, this bill will give an insurmountable competitive advantage to foreign refiners over domestic refiners like Lion Oil, and will result in the outsourcing of our energy future and the loss of hundreds of thousands of domestic jobs in the refining industry and at the companies that rely on our industry.

Third, this attack on domestic refiners cannot be justified on an environmental or climate change basis given the generous allowances allocated to other industries that emit CO2. And finally, it is the consumers that ultimately will pay for this bias against domestic refiners, either through higher retail prices for gasoline and diesel, higher food prices due to higher energy costs to farmers, increased dependence on oil and refined petroleum products or higher costs for all products due to higher transportation energy costs.

I would like to briefly elaborate on the previously mentioned threat from foreign competition. This point is significant, given the fact that India is building a one million barrel per day refinery to make transportation fuels that will be exported almost exclusively to the U.S. and European markets. This massive refinery – larger than any refinery in the United States – is

equal to the total capacity of about 15 Lion Oils. Under this bill, this Indian refinery, which already operates at a significant cost advantage, will not be required to purchase allowances for the CO2 emitted from its plant. As a result, Lion Oil and other domestic refiners will be placed at an immediate and perhaps fatal competitive disadvantage with respect to this Indian refinery and other foreign refiners. Such a competitive disadvantage will inevitably lead to U.S. domestic refining capacity being shut down – to be replaced entirely by transportation fuels imported from foreign refineries.

To summarize, the current allocation of allowances under this bill is at best unfair and at worst punitive. It will cause my company, and perhaps many other refiners across the United States, to close their domestic refining operations. This bill should be defeated in its current form to protect the domestic refining industry and the quality jobs we provide to tens of thousands of individuals across the country, and to protect consumers, farmers and truckers from higher gasoline and diesel fuel prices.

I appreciate the opportunity to appear before you today and I would be pleased to answer any questions that you may have.

Mr. MARKEY. Thank you, Mr. Cousins, very much.

Our next witness is Mr. Tommy Hodges. He is the chairman of Titan Transfer Incorporated and will speak today on behalf of the American Trucking Association. We welcome you, sir.

STATEMENT OF G. TOMMY HODGES

Mr. HODGES. Thank you, Mr. Chairman, Ranking Member Upton and other members of the committee. My name is Tommy Hodges. I am chairman of Titan Transfer out of Shelbyville, Tennessee, a nationwide truckload carrier hauling all type of goods all across the country. I also come on behalf of the American Trucking Association as first vice chairman of that association and also as chairman of the ATA's sustainability task force, an effort that we have made over 2 years ago to try to reduce our carbon footprint.

Mr. Chairman, we are an industry of small businesses. Roughly 96 percent of all trucking companies in America have 20 or fewer trucks and are considered by any standard small businesses. Our industry operates on margins on fractions of cents. We are a penny industry that handles dollars in and hopes a few pennies stick to the bottom line. We are especially vulnerable to fluctuations that are sudden and out of our control in our operating expenses, as we have witnessed in 2007 and 2008, over 5,000 small trucking companies going out of business and much of that can be traced back to the volatility of fuel of 2008.

Since 1998, the trucking industry has been a major contributor and participant in cleaning up in our atmosphere. Over 90 percent of the particulate matter and nitrous oxides have been eliminated from our exhaust pipes at a tremendous cost. A catalytic converter on a new truck costs me as an investor in that equipment $9,700. We cannot continue to add costs on an industry that is so vital to our economic engine. Let me take my company as an example. We have a little over 400 trucks based on Shelbyville. We drive about 36 million miles a year and we use a little over 5 million gallons of fuel. A sudden impact on that when we operate on pennies puts us out of business. We cannot afford to do that. Speculation in the carbon markets will add to the volatility of this fuel and drive more companies out of business. The Nation's long-haul trucking industry depends on diesel fuel. We are not recreational users. We don't choose to go to the movie house in our trucks. We use the fuel to deliver products and services to the American public. We don't make useless trips. We would be out of business if we did so.

One of our biggest concerns about H.R. 2454 is that none of the generation of monies from the sale of these carbon taxes or carbon credits will go to fix one of the critical problem we have in the Nation, and that is the lack of capacity on our highways, congestion. We waste about 62 billion gallons of fuel over a 10-year period by going nowhere, stuck in traffic. Nothing that we have read in this bill solves one bit of that problem. We think it is imperative that that gets addressed.

Mr. Chairman, as the previous Mr. Cousins indicated, when 30 to 35 percent of our carbon problem is generated by petroleum-based burning, whether that is in our trucks or whatever use, and we only give a 2 percent credit to that industry, we are mandating volatility. We will have no choice. We will again drive small busi-

nesses out of business. The allocation shortfall will have a dramatic impact upon the price of petroleum derived from fuel and will negative impact the trucking industry and the U.S. economy by adding another layer of volatility to the price of fuel. Special consideration should be given to diesel fuel if nothing else under H.R. 2454 because of its critical nature of moving America's goods. We have a saying in our industry, and it is simply that without trucks, America stops. We believe that. Trucking is and will remain the predominant means of moving the Nation's freight.

We must be careful not to inhibit the ability of the Nation's trucking fleets to afford fuel purchases in order to keep up with business and consumer demands for products. If the diesel fuel prices are not kept in check, the movement of the Nation's freight will be impeded and the very core of the Nation's economy impacted. One might ask how. In our area of the woods, there is a little plant in Red Boiling Springs called Nestle's and they make water, and all of us got addicted to carrying around a bottle of water, and that bottle of water is far more expensive than diesel fuel but we still spend and buy it, and most of the times we will buy a bottle for 99 cents. If that bottle suddenly costs us a dollar, you may not buy that bottle of water, but with little thought that you just put somebody out of a job in Red Boiling Springs. And some of the proponents may ask quickly, well, they will find another job in a green industry. There is no other industry in Red Boiling Springs, Tennessee.

Mr. MARKEY. Can you summarize, please, Mr. Hodges?

Mr. HODGES. Yes. Mechanisms should be put in place to ensure fuel emissions and allowances that in fact keep prices in check.

Thank you, Mr. Chairman. This concludes my oral remarks and I would encourage each member to read and study my written testimony and would be happy to provide ATA's sustainability task force reports to committee members.

[The prepared statement of Mr. Hodges follows:]

Before the
House Committee on Energy and Commerce
Subcommittee on Energy and Environment

Statement of G. Tommy Hodges, Chairman
Titan Transfer, Inc.
P.O. Box 590
Shelbyville, TN 37162
on behalf of the
American Trucking Associations, Inc. (ATA)

Allowance Allocation Policies in Climate Legislation: Assisting Consumers, Investing in a Clean Energy Future, and Adapting to Climate Change"

June 9, 2009

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to present testimony on the *American Clean Energy and Security Act of 2009* (H.R. 2454). My name is Tommy Hodges. I serve as the Chairman of Titan Transfer, Inc., based in Shelbyville, Tennessee, a full-service truckload carrier operating throughout the Midwest, southeast, northeast, and southern California. In addition, I also serve as Chairman of Goggin Warehousing, LLC; Chairman of HEC Leasing, Inc.; and Chairman of IWLAIC Insurance Company, a group captive insurance company. Today, I appear before you representing not just my company, but also the American Trucking Associations (ATA) headquartered in Arlington, Virginia. I currently serve as First Vice Chairman of ATA and Chairman of its Sustainability Task Force.

ATA is the national trade association of the trucking industry. Through its affiliated state trucking associations, affiliated conferences, and other organizations, ATA represents more than 37,000 trucking companies throughout the U.S.

Overview of the Trucking Industry

With more than 600,000 interstate motor carriers in the U.S., the trucking industry is the driving force behind the nation's economy. Trucks haul nearly every consumer good at some point in the supply chain. Few Americans realize that trucks deliver nearly 70 percent of all freight tonnage or that 80 percent of the nation's communities receive their goods exclusively by truck. Even fewer are aware of the significant employment, personal income, and tax revenue generated by the motor carrier industry.

Nearly 9 million people employed in the trucking industry move approximately 11 billion tons of freight annually across the nation. Trucking annually generates $660 billion in revenues and represents roughly 5 percent of our nation's Gross Domestic Product. One out of every 13 people working in the private sector in the U.S. is employed in a trucking-related job ranging across the manufacturing, retail, public utility, construction, service, transportation, mining, and agricultural sectors. Of those employed in private-sector trucking-related jobs, 3.5 million are truck drivers.

The trucking industry is composed of both large national enterprises as well as a host of small businesses, all of whom operate in extremely competitive business environments with narrow profit margins. Roughly 96 percent of motor carriers have 20 or fewer trucks and are considered small businesses.

ATA supports efforts to make this country more energy independent while at the same time reducing greenhouse gas (GHG) emissions. My testimony today is limited to allocation provisions in H.R. 2454 that will impact diesel fuel, along with ATA's recommendations as to how the trucking industry can reduce its carbon footprint and achieve greater energy efficiencies.

Trucking Industry Concerns Over H.R. 2454

A. Increased Fuel Costs

The trucking industry is concerned that H.R. 2454 will significantly increase the price of fuel we consume. Fleets are extremely sensitive to rapidly shifting operating costs given thin operating margins of between 2-4 percent. These margins continue to be chipped away given the numerous and unprecedented costs being imposed upon the industry to reduce emissions from trucks. For instance, new diesel engine emission standards imposed by the U.S. Environmental Protection Agency (EPA) in 2002 drove up engine costs on average between $3,000 to $5,000 while decreasing fuel economy between 6-8 percent. Additional EPA diesel engine emission standards in 2007 drove up the cost of engines between $8,000 to $10,000 and, by many accounts, decreased fuel economy between 2-4 percent. Diesel engine emission standards set to take effect in 2010 could again increase new engine costs up to $10,000. However, we hope to experience a reversal of fuel economy loss with the introduction of these new engine technologies.

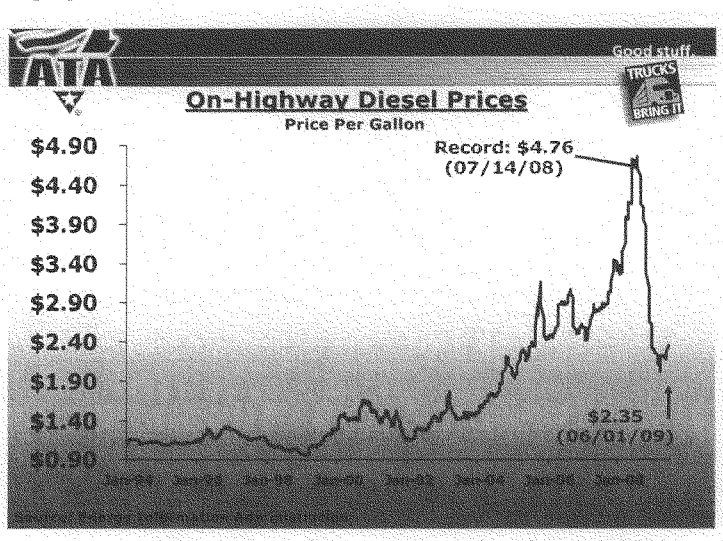
To illustrate the significance of these reductions and the progress being made to produce today's near-zero diesel engine emissions, every 60 new trucks purchased this year will equal the PM emissions of 6 trucks purchased just three years ago and of a single new truck purchased 20 years ago. These new trucks also began the first half of what ultimately will be an additional 90 percent reduction in nitrogen oxide (NOx) emissions. Put another way, clean diesel engines are as clean or cleaner than comparable natural gas vehicles.

Not only have equipment costs increased due to federal requirements, state regulatory mandates have substantially increased the financial burdens being placed upon our industry. Beyond the actual increases in equipment costs, the impact of reduced fuel

economy further increased the operating costs of the industry and had the unfortunate effect of increasing the trucking industry's carbon footprint.

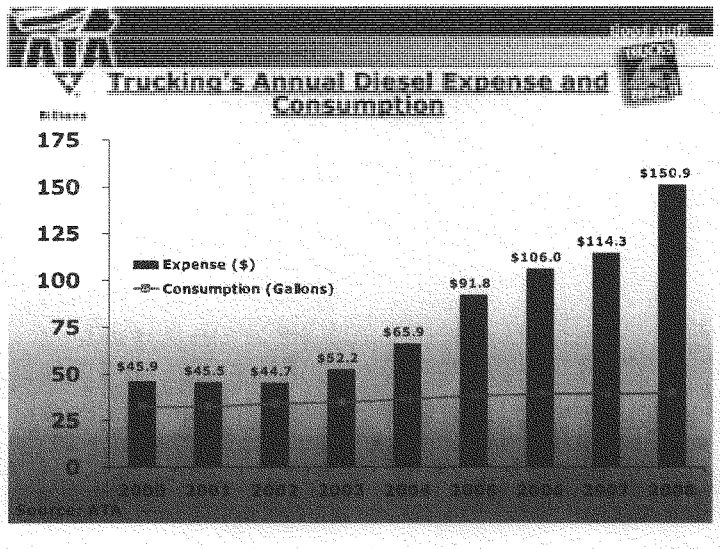
I would like to take a few minutes to further expand upon the critical role diesel fuel plays in the trucking industry. The nation's long-haul truck industry depends on diesel fuel. Diesel fuel provides greater fuel economy and the higher energy content necessary to transport widely --diversified loads under extreme operating conditions. Diesel fuel is the main source of carbon emissions from our industry equating to 22.2 pounds of CO_2e per gallon of fuel at the point of combustion and 27.1 pounds of CO_2e when accounting for lifecycle emissions. While the transportation sector emits 28 percent of all U.S. GHG's, trucking contributes ***less*** than 6 percent of total U.S. carbon emissions.[1]

While today's price for diesel fuel is a far cry from the nearly $5/gallon we experienced in July 2008, these depressed diesel fuel prices are only temporary and once the economy rebounds, so will the escalation of fuel prices even in the absence of a cap-and-trade program.



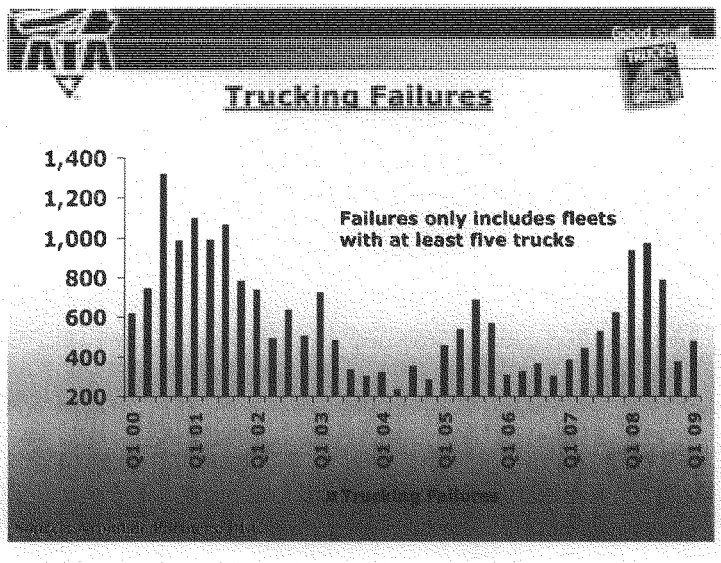
In 2008 trucking consumed over 39 billion gallons of diesel fuel. This means that a one-cent increase in the average price of diesel costs the trucking industry an additional $390 million in fuel expenses. Fleets spent an astonishing $151 billion on fuel in 2008, a $36 ***billion*** increase from 2007 and more than double the amount spent in 2004.

[1] U.S. EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (April 15, 2009).



To provide a better illustration as to the impact that increased fuel prices has on an individual trucking fleet, let me use my company as an example. I run 450 tractors, operate 1,250 trailers, and employ 470 hard-working professional men and women. My company consumes 30 million gallons of diesel fuel annually. At this volume, $2/gallon diesel fuel equates to a fuel bill of $60 million/year; at $3/gallon, $90 million/year; and at $4/gallon, $120 million/year. While it is difficult to predict how much fuel prices will increase under a cap-and-trade approach, let us assume four scenarios of diesel fuel increases: $.10/gallon, $.25/gallon, $.50/gallon, and $1.00/gallon. For my company, that would mean an additional cost burden of $3 million, $7.5 million, $15 million, and $30 million per year respectively, costs that will be difficult to absorb. Diesel fuel price increases exceeding these scenarios will further devastate the movement of this nation's freight. In addition to the direct costs associated with the proposed carbon reductions in H.R. 2454, speculation in the emerging carbon markets may further increase fuel costs leading to uncertain and unstable energy market futures and throw our best business planning out the window.

Sudden fluctuations in operating expenses, especially fuel, raise havoc in the trucking industry. With the downturn in the economy and soft demand for freight transportation services, trucking companies are struggling to survive. In 2007 and 2008, over 5,000 trucking companies with at least 5 trucks failed and thousands of independent operators, drivers, and employees have lost their jobs. A large number of companies that operate fewer than 5 trucks have also turned in their keys. These hardships surprise few in the industry, but may surprise those less familiar with the nature of freight movement.



As I noted earlier, trucking is a highly competitive industry with very low profit margins. This explains why many trucking companies are reporting that as fuel prices increase, profits are greatly suppressed, if they are making a profit at all. Fleets can not absorb rapid increases in fuel costs. That is why the trucking industry is extremely sensitive to how H.R. 2454 may further escalate fuel prices.

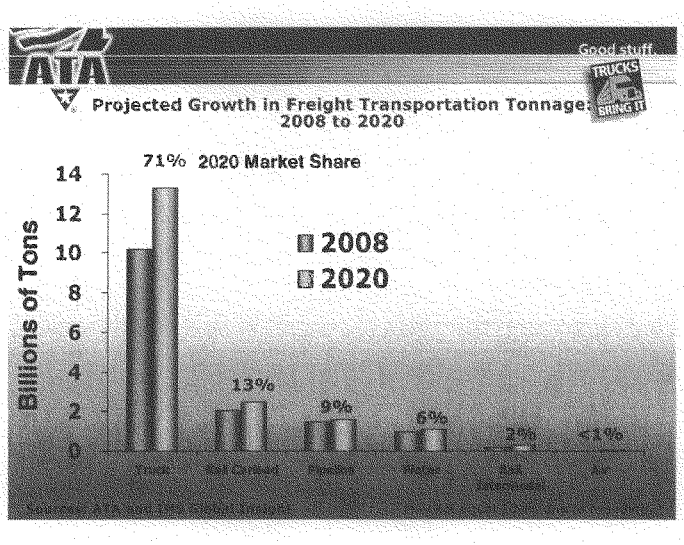
B. Free Allowances for Refinery Operations and Fuels are Inadequate

Provisions under H.R. 2454 granting oil refiners 2 percent of the carbon allowances between 2014 and 2016 to help mitigate refinery GHG emissions are inadequate and will result in significant price increases for refined products. GHG contributions from the refining sector (including the refining facilities as well as the combustion of the fuels they produce) make up about 45 percent of total U.S. energy emissions. Free allowances proposed to be allotted to energy GHG emissions from electricity, natural gas, and energy-intensive/trade-exposed industries are 32 percent, 9 percent, and 15 percent respectively, yet refining operations and the products they produce are allocated only 2 percent of the allowances to cover facility emissions, but also emissions while failing to address any petroleum products they produce. This allocation shortfall will have a dramatic impact upon the price of petroleum-derived fuel and will negatively impact the trucking industry and the U.S. economy.

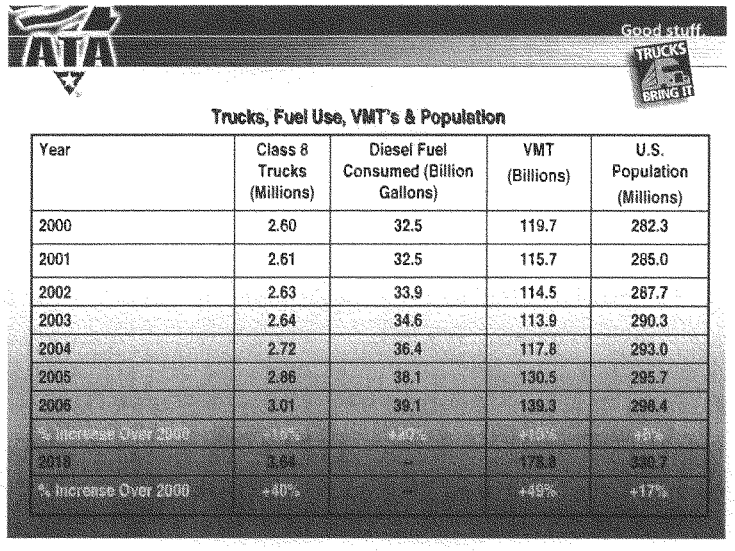
The 2 percent allotment to refineries over a 2-year period covers the refineries' facility emissions, but totally ignores carbon emissions from the combustion of petroleum products and leaves downstream users, such as trucking companies, exposed to dramatic and sudden fuel price spikes. A misconception exists that any increase in energy costs can simply be passed through to the next downstream entity. In reality, 100 percent of fuel cost increases can not be passed along from the refinery to the ultimate consumer.

Not every entity throughout the supply chain will recoup all cost increases passed onto it due to market uncertainties and the cost-competitive nature businesses.

Trucking's fuel cost increases should be taken into account under H.R. 2454 to ensure economic stability and growth in this country. We have a saying in our industry -- *Without Trucks America Stops*. Trucking is, and will remain, the predominant means of moving the nation's freight. In fact, by the year 2020, 71 percent of freight transportation tonnage.



Keep in mind that as the U.S. population continues to grow, so does the corresponding demand for more consumer goods. The demand for more products equates to a need for more trucks which results in more vehicle miles traveled and more diesel fuel consumed. The following table shows the relationship between Class 8 trucks, diesel fuel demands, vehicle miles traveled, and population projections for the U.S.



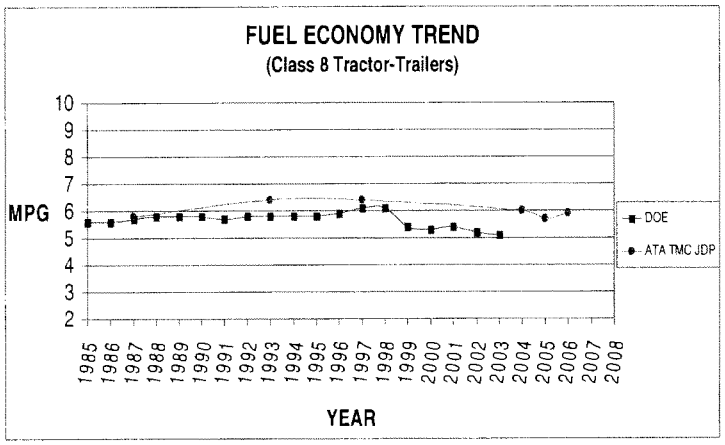
Trucks, Fuel Use, VMT's & Population

Year	Class 8 Trucks (Millions)	Diesel Fuel Consumed (Billion Gallons)	VMT (Billions)	U.S. Population (Millions)
2000	2.60	32.5	119.7	282.3
2001	2.61	32.5	115.7	285.0
2002	2.63	33.9	114.5	287.7
2003	2.64	34.6	113.9	290.3
2004	2.72	36.4	117.8	293.0
2005	2.86	38.1	130.5	295.7
2006	3.01	39.1	139.3	298.4
% Increase Over 2000	+16%	+40%	+16%	+6%
2018	3.64	--	178.8	330.7
% Increase Over 2000	+40%	--	+49%	+17%

Since trucking consumes over 90 percent of the nation's on-road diesel, H.R. 2454 must not inhibit the ability of the nation's trucking fleets to afford fuel purchases in order to keep up with business and consumer demands for products. If diesel prices are not kept in check, the movement of the nation's freight will be impeded and the very core of the nation's economy will be impacted. While it is important to increase the amount of free allocations for refinery operation emissions, it is more critical to set aside free allowances specific to diesel fuel to mitigate dramatic fuel pricing increases. Mechanisms should be put in place to ensure any diesel fuel emission allowances are in fact used to keep fuel prices in check.

There are Reasonable Measures to Further Reduce Carbon Emissions from Trucks

Any substantial cost increases imposed directly or indirectly on trucks by H.R. 2454 will curtail the delivery of vital consumer goods across the nation such as food, medicine, and clothing. Constraining the country's freight delivery system would change our way of life for the worse by significantly increasing the cost of everything we buy. Fuel economy of trucks has not improved appreciably over the last quarter century and average between 6.0 and 6.5 miles per gallon. Heavy-duty trucks are far different from passenger cars. There are currently no mass-produced hybrid trucks, truck fuel economy continues to remain stagnant, and truck movement is not discretionary – it is undertaken to conduct business operations, not pleasure. In short, trucking is unlike any other industry, mobile source or otherwise. We are dependent upon the use of diesel as our fuel of choice for both its efficiency and cleanliness.



Sources: American Trucking Associations (ATA)
ATA Technology & Maintenance Council (TMC)
JD Powers & Associates (JDP)
U.S. Department of Energy (DOE)

The trucking industry believes that mobile sources, such as commercial trucks, should be addressed differently than traditional stationary sources under any proposed carbon reduction regulatory program. Since there are better, cost-effective measures to use to reduce carbon emissions from the trucking industry, ATA developed its *Strategies for Reducing the Trucking Industry's Carbon Footprint.* (To view ATA's plan, go to: http://www.trucksdeliver.org/pdfs/Campaign_Executive_Summary.pdf).

ATA's sustainability agenda includes: (1) enacting a national 65 mph speed limit and governing truck speeds at 65 mph for trucks manufactured after 1992; (2) increasing fuel efficiency through EPA's SmartWay[SM] Program; (3) supporting national fuel economy standards for medium- and heavy-duty trucks; (4) decreasing idling; (5) reducing highway congestion through highway infrastructure improvements; and (6) promoting the use of more productive truck combinations.

ATA's sustainability agenda could reduce trucking's annual carbon emissions by more than 20 percent. These reasonable measures will bring real results for reducing trucking's carbon footprint while at the same time reducing other regulated emissions, enhancing safety, helping to achieve energy independence, and keeping the nations economic engine churning.

ATA and Titan Transfer appreciate the opportunity to offer the trucking industry's testimony before this Committee and I look forward to answering any of your questions. Thank you.

Mr. MARKEY. Thank you, Mr. Hodges, very much.

Our next witness is Mr. David Montgomery. He is the vice president of Charles River Associates and co-head of their energy and environment practice. Welcome, sir.

STATEMENT OF DAVID MONTGOMERY

Mr. MONTGOMERY. Thank you, Mr. Chairman. I am honored by your invitation to appear today. Although I am the vice president of Charles River Associates, I am speaking to my own conclusions today as an economist. I have actually worked on the subject of emission trading for close to 40 years, I made the unfortunate calculation, starting with my Ph.D. thesis that turned into the first rigorous theoretical analysis of how a cap-and-trade program could actually be made to work.

My testimony today is based on some of the findings in a report that was recently authorized by several of us at Charles River Associates and I would like to submit that for the record as well as my testimony in order to try to provide backup for the statements.

Mr. MARKEY. Without objection, it will be included in the record.

Mr. MONTGOMERY. Thank you. I think the most important point in my testimony is that no distribution of allowance value can eliminate all of the costs of capping emissions. Free allowances can only eliminate the necessity of paying the government for permission to emit up to the level of the cap. But even if allowances are free, businesses and consumers must still bear the costs of the actions that they need to take to get emissions down to the cap. I think this is the point also made by Mr. Sokol and I think he is absolutely right on that.

The cost of bringing emissions down to the cap is reflected in reductions in GDP and household consumption. Allocations do shift who bears the burden across industries, regions and income groups as would decisions about how to spend or return to taxpayers the revenues from allowance auctions but it is important to keep in mind that there is never enough to go around in the allowance value and completely insulating some parties only increases the share of the cost of achieving the cap must be borne by others. The cost for the average family would be significant even after taking into account free allocations and spending of auction revenues. These impacts can't be predicted with certainty but taking into account all of the provisions of the bill in our analysis on average nationwide the cost per household in 2020 could be from $600 to $1,600 per household, and we base this range on what I think are reasonable assumptions at both ends of the range.

It is also important not to be deceived by these averages in looking at the impacts on any particular sector or group. The cost, for this hearing, I have taken a closer look at the regional impacts of H.R. 2454, taking into account the 50/50 formula for allowance allocations to local distribution companies in particular. Even with those allowance allocations, our analysis suggests that the regional impacts would be unequal and uneven. Impacts on household income differ across regions and appear regressive based on regional average income and the magnitude of cost increases. The wealthiest regions, Northeast, Mid-Atlantic and California, have the lowest cost and the two least wealthy regions, which in our analysis

are Oklahoma, Texas and the Southeast, have the highest cost per household. The free allocations to electric local distribution companies according to the formula will also lead to different increases in electricity rates in different regions. Interestingly, there also seems to be an inverse relationship between regional income and the benefits of free allowances. The Southeast has the lowest average regional income and a 15 percent increase in electricity costs while the Northeast has the highest average regional income and nearly no increase in electricity costs.

International offsets and allocations to tropical deforestation also play a huge role in H.R. 2454. All the economic impacts I have discussed would be much larger if the full amount of international offsets allowed by the bill does not become available, and I think there is some significant questions that have been raised by recent studies about whether the countries that are suffering now from the highest rates of deforestation and forest degradation have the institutional capacity to meet the requirements of ACES for governance of those forests.

Let me turn to another topic that I think is quite important. Despite some claims to the contrary, how allowances are allocated can have effects on the overall economy. It depends on the allocation formula. In particular, thinking about the allocations to LDCs, if free allowances are used to reduce energy prices seen by consumers, the incentive to conserve energy will be reduced and the costs of complying with H.R. 2454 will increase. Two other use of allocations can also increase economic impacts. Technology subsidies that lead to uneconomical choices of technology such as bonus allowances for CCS or use of allocations to interfere with the economics of fuel switching will raise costs. Output-based allowances to industries can also lead to uneconomic choices in the level of output.

The output-based award of allowances to specific trade impact of industries has been mentioned a couple of times today but it appears to me based on the work we have done on trade issues that it would be in direct violation of the WTO agreement on subsidies and countervailing measures. It would likely to be ruled an actionable subsidy if any other country were to challenge it before the WTO. Everything about the WTO is murky but this possibility seems to have gone unrecognized. It needs to be carefully considered, otherwise we might pass a bill into law that we later discover doesn't have any real trade protection at all.

If any of these problems materialize, limited availability of international offsets, distortions created by free allocations, and I would also mention, I discuss in my testimony, unnecessary regulatory measures that could raise costs by imposing the judgment of Congress and government agencies over the judgment of consumers in response to a cap-and-trade program, and the bill contains many regulatory measures but the idea of a cap-and-trade program is to put a price out there and let individual businesses and consumers make the decision. I am in favor of letting the market work that way but those regulatory measures, if they become binding, could significantly increase the cost of the bill and change it. Anyway, if any of these materialize, then the cost of reducing emissions to the stated caps will increase. I think that is relevant to the topic today

because the higher the cost is of getting emissions down to the cap, the harder it is to use allocations to insulate needy portions of the economy from the cost and larger will be the cost that those who do not get free allocations have to bear.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Montgomery follows:]

Prepared Testimony of
W. David Montgomery
before the
Committee on Energy and Commerce
Subcommittee on Energy and Environment
U.S. House of Representatives
Hearing on Allowance Allocation Policies in Climate Legislation
June 9, 2009

Mr. Chairman and Members of the Committee:

I am honored by your invitation to appear today, to testify on the topic of allocating allowance value in a program to reduce greenhouse gas emissions. I am Vice President of CRA International, and an economist by profession and training. Much of my work for close to 20 years has dealt with the economics and policy of climate change. I will provide my perspectives on the economic implications of allowance allocations as currently provisioned in H.R.2454 (hereafter, ACES). My testimony is based on relevant findings in a report recently authored by several colleagues and me, which I would like to submit for the record in order to provide backup for statements in this testimony.[1] My statements in this testimony represent my own opinions and conclusions, and do not necessarily represent the position of my employer or any of its clients.

Key Points

My testimony contains eight key points.

1. The allocation of allowances cannot eliminate the cost of a cap and trade program; it can only change who bears the cost. Free allocations can remove some or all of the cost of obtaining allowances that grant permission to emit up to the stated caps; but no matter how allowances are distributed, none of the cost of the actions that must be undertaken to bring emissions down to satisfy the caps can be removed. At best, that distribution can eliminate the cost of purchasing allowances from the government. Nothing can eliminate the cost of reducing emissions from their projected business-as-usual level to the capped level, though there are many ways of hiding or shifting that cost around.

2. The cost for the average family will be significant even after taking into account free allocations and recycling of auction revenues. These impacts cannot be predicted with certainty, and could range in 2020 from $600 to $1,600 per household.

3. Even with allowance allocations in the current version of ACES, regional impacts are projected to be unequal and uneven. Free allocations to electric local

[1] "Impact on the Economy of the American Clean Energy and Security Act of 2009 (H.R.2454)," prepared for the National Black Chamber of Commerce, May 2009.

distribution companies (LDCs) according to formulae in the bill will lead to different increases in electricity rates and utility bills in different regions.

4. The economic impacts would be much larger if the full amount of international offsets allowed by the bill does not become available. It is unlikely that the full amount will be available because of the difficulty of obtaining adequate verification and assurances of permanence and additionality for avoided deforestation in the countries most likely to offer these offsets.

5. How allowances are allocated or revenues from auctions are used can have economic effects, but it depends on exactly how they are used. In particular, if free allowances are used to reduce energy prices seen by consumers, the incentive to conserve energy will be reduced and the costs of complying with ACES will increase.

6. The regulatory provisions in ACES could make the cost to households much higher, and there is nothing either allocations or offsets can do about that increase. For example, renewable energy and energy efficiency standards mandate specific technology and changes in energy-using equipment, without regard to whether they would be chosen by rational consumers and businesses under the incentives created by the cap and trade program.

7. If limited availability of international offsets, distortions created by free allocations, or unnecessary regulatory measures increase the costs of complying with ACES, then the costs of reducing emissions to the stated caps will increase. Other uncertainties, such as the costs of demand response, could also lead to much higher overall costs of bringing emissions down to the cap.

8. If the costs of meeting the cap turn out higher than expected, for any of these reasons, the decision to insulate some groups from the impacts of the bill through free allocations will force the remainder of the economy – including in particular the general consumer – to face even higher costs.

Summary

Limits on greenhouse gas emissions will impose a cost on the U.S. economy, and the cost will be larger for tighter targets. In a study of ACES, my colleagues and I have estimated a 2020 decline in GDP (relative to what it would be without this policy) of approximately 1.2% (based on our Reference case, as are other results cited in this testimony unless otherwise specified). In ACES and in prior bills, we see exactly the same mechanisms at work. To bring emissions down from business-as-usual levels to the cap, it is necessary to adopt more costly methods of electricity generation, to invest in producing more expensive, low-carbon fuels and to undertake more intensive energy conservation measures. These actions divert resources that would otherwise be available to produce other goods and services that make up GDP into the provision of the same or lower level

of energy services. Higher energy costs raise the costs of U.S. manufacturing relative to competitors in countries that do not adopt limits on greenhouse gas emissions.

Another important impact is the reduction in the standard of living of the average household, which I refer to as "cost to households," which could increase by anywhere between $600 to $1,600 in 2020, taking estimates from our High and Low cases and assuming that all the international offsets authorized by the bill are available. This cost includes all the negative effects of ACES on the average U.S. family, including higher prices for energy and other goods, lower wages and reduced hours of work, reduced returns from savings and retirement investment, and all the offsetting effects of free allowances and rebates of auction revenues on a household's disposable income.

The most important observation is that the allocation of allowances cannot make the cost of a cap and trade program go away, it can only change who bears the cost

Although wise use of revenues from an auction or carbon tax can ameliorate impacts to some segments of the economy, the cost of bringing emissions down to levels required by the caps cannot be avoided.

Free allocations of allowances can at most eliminate the cost of purchasing allowances from the government. These allowances grant permission to emit greenhouse gases up to the amount allowed by the caps specified in the bill. But there is also a substantial cost of bringing emissions down from the level they would reach without ACES – for example levels projected in the EIA 2009 Annual Energy Outlook – to the caps. The only way that free allocations could eliminate all cost to emitters is if the cap were set at a level that required no additional action – a level that emissions would achieve without the cap. Then free allowances would eliminate all cost. Otherwise, if any actions must be taken to reduce emissions, then the cost of these actions cannot be eliminated by recycling allowance values. It is this cost of bringing down emissions that I have discussed, in terms of reductions in GDP and household consumption. Allocations do shift who bears the burden across industries, regions, and income groups, as do decisions about how to spend or return to taxpayers the revenues from allowance auctions.

Therefore, it is to be expected that there will always be more claims for compensation than there are allowances to allocate. Indeed, the higher the cost of bringing emissions down to the cap becomes, the harder it will be to insulate some groups from the impacts, and the larger will be the potential claims by other groups that their losses have not been ameliorated.

It is also important to avoid being deceived by averages in estimating how a particular sector or segment of the population, for example electricity consumers, is affected by the net effect of ACES inclusive of allowance allocations. There are enough hidden differences among recipients of allowances within any identified group that it takes far more to compensate just the losers in a group than to compensate the average. Looking at averages assumes that gainers compensate losers within a group, but that will not occur in practice. Thus, as discussed below, the free allocation of allowances to utilities for the

benefit of their consumers appears to hold increases in average bills nationwide to 10% in 2020 (in our High case). But regionally, the unequal distribution of cost increases and allowances leaves a range from almost no increase to an increase of over 16%. The same is likely to be true of every other group targeted with free allowances.

Since aside from free utility allowances, "assistance" and "further consumer rebates" all go to identified groups, those not included in specific allotments of free allowances will see only the cost of bringing emissions down to the specified caps. The one group least likely to be represented in the bargaining for allowances is the average middle-income family, which has the least audible voice in the process of negotiating for a free allocation, and it is this family that is therefore most likely to be saddled with the remaining cost after groups with strong representation are allocated free allowances.

The cost for the average family will be significant even after taking into account free allocations and recycling of auction revenues

Several of the provisions in ACES are designed to help lower the cost to households by providing free allowances to regulated electricity and natural gas LDCs and using auction revenues to assist lower-income households. While these mechanisms will help mitigate the increased *energy* cost borne by households, it is not possible for households to avoid the increases in *other costs* due to the policy. These other costs, which include costs of other goods and services, declining wages, hours worked, investment and retirement income, and increasing taxes, will still rise, because allocations simply shift the cost burden from one segment of the economy to another but do not reduce the overall cost. The overall policy cost of bringing emissions down to levels required by the cap cannot be avoided. It is this cost of bringing down emissions that our analysis estimated, in terms of reductions in GDP and household consumption.

Provisions in ACES specify the use of allocations to reduce the fixed portion of electricity and natural gas ratepayer's bills while leaving rates high enough to maintain the incentive for conservation.[2] To the extent that utilities return the value of their free allocations under ACES to customers through reductions in fixed charges, actual total *bills* for electricity and natural gas will not rise as much as the *rates*. In fact, total utility bills may decline in the first years of the policy if there is also substantial investment in end-use efficiency and/or conservation in response to the higher energy rates. However, based on our Reference case, we estimated that average U.S. natural gas utility bills, inclusive of allocations to natural gas LDCs in ACES, would increase by about 2.5% in 2015, and 5% to 6% in 2020 to 2025, and then rise more dramatically as the allocations are phased out. For average U.S. electricity bills, we estimated that given the allocations in ACES that average bills would decline by about 0.5% in 2015, and then rise by about 4% to 5% in 2020 to 2025. Post-2025, as the allocations are phased out bills would rise more dramatically. These bill impacts would roughly double when we consider the possibility that all of the international offsets may not be available (*e.g.*, in our High case).

[2] Sec. 783 (b)(4)(C) and Sec. 784(c)(3).

Our analysis showed that retail rates, exclusive of rebates and credits from allocations and auction revenues, would be significantly higher in the policy than in the absence of ACES. Relative to the baseline, retail natural gas rates would rise by an estimated 10% ($1.20 per MMBtu) in 2015, by 16% ($2.30 per MMBtu) in 2030 and by 34% ($5.40 per MMBtu) in 2050. Retail electricity rates are estimated to increase by 7.2% (1.1 cents per kWh) relative to baseline levels in 2015, by 21% (2.8 cents per kWh) in 2030 and by 44% (6.1 cents per kWh) in 2050.

Figure 1: Change in Natural Gas Rates from the Baseline

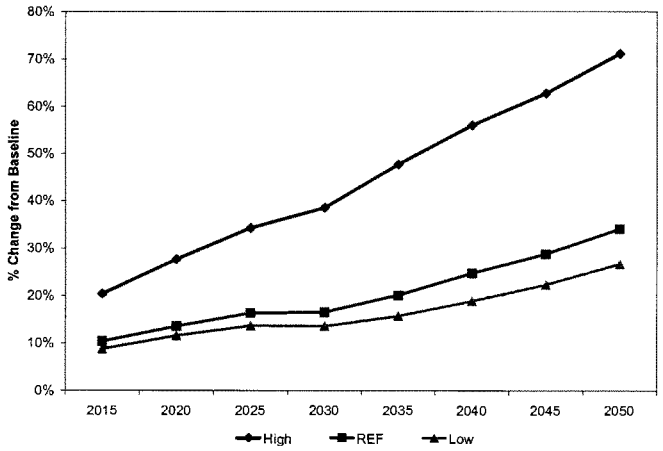
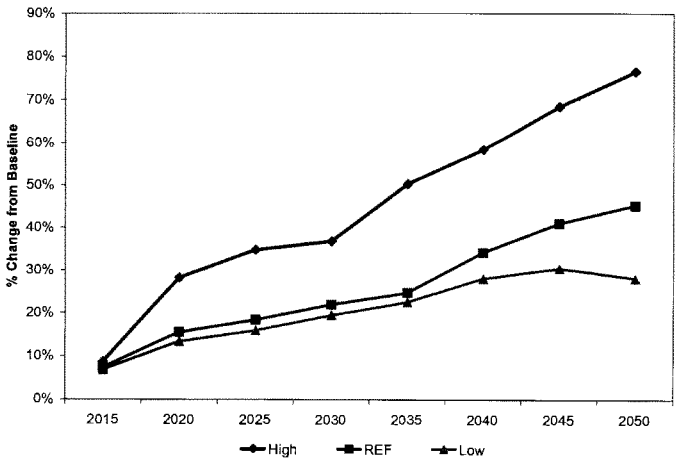


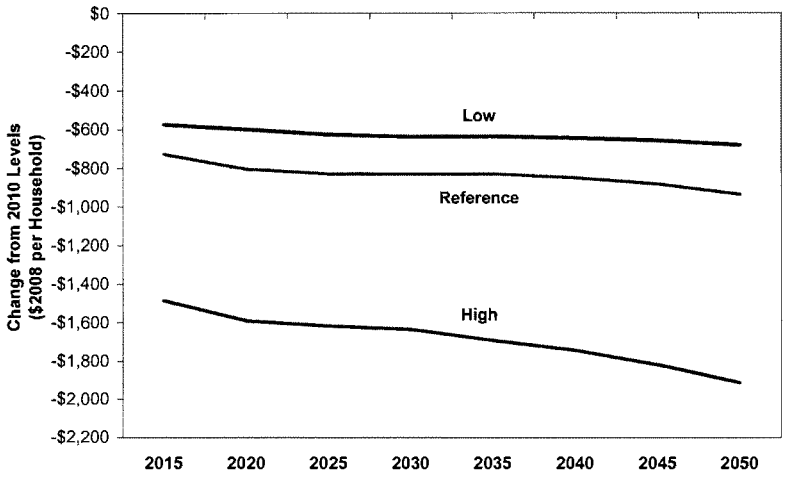
Figure 2: Change in Retail Electricity Rates from the Baseline



For an average household, the total cost due to ACES is estimated to be about $800 in 2020 if all of the international offsets are freely available immediately, as illustrated in Figure 3. Free allowances and programs to return allowance values directly to consumers only partially offset price increases and income losses due to the policy. Although, as discussed above, free allowance allocations to utilities substantially reduce electricity and gas bills for an average U.S. household, they do nothing to reduce higher costs of refined products (gasoline, diesel, and home heating oil) or other goods, and losses in wages by working families and investment income are not addressed.

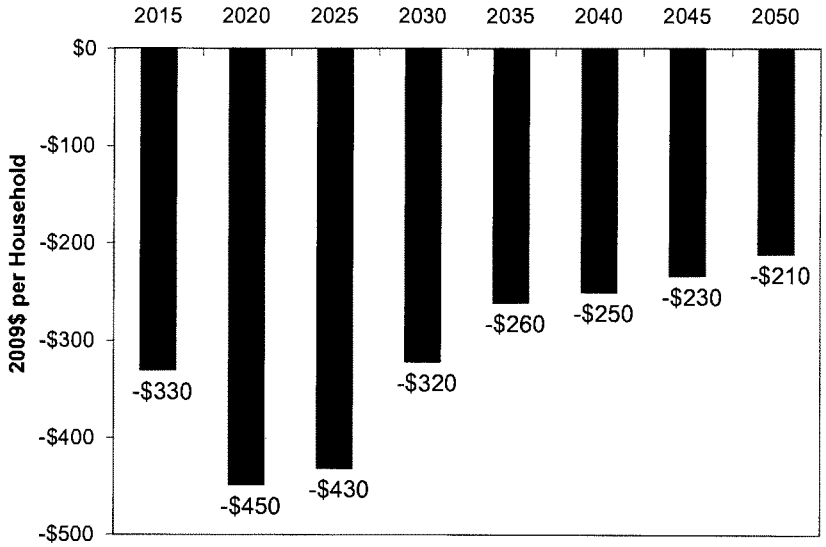
Of the $800 total cost to the average household in 2020, about 25% can be attributed to increases in electricity and natural gas costs (before addressing the benefits of free LDC allocations), and about 10% can be attributed to increases in refined product (gasoline and heating oil prices). The remainder represents the impact of costs of other goods and reduced income, net of allowance value returned to households through the allocation provisions of ACES. We also assumed that all auction revenues would be returned to households, except for the allowance allocations that are given to foreign sources.

Figure 3: Loss in Household Purchasing Power Due To ACES



A large part of the impact on household costs is due to wealth transfers to other countries as shown in Figure 4. In 2020, wealth transfers to other countries account for a loss in per household purchasing power of $450, which represents 56% of the total loss in per household income.

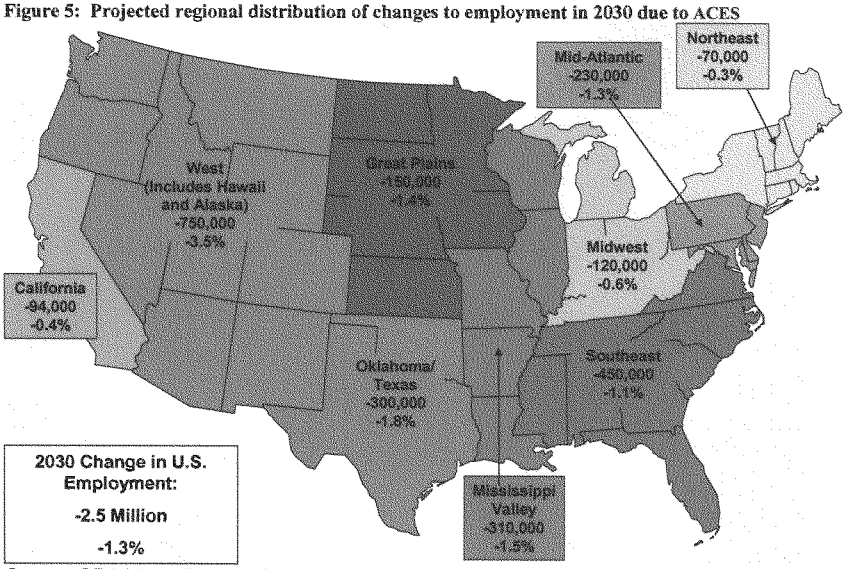
Figure 4: Impacts of International Wealth Transfers on Households



Even with current allowance allocations, regional impacts are projected to be unequal and uneven

Figure 5 indicates that the projected job losses would be distributed throughout the country. Regions that experience a larger decline in employment relative to the U.S. average are the West, Oklahoma/Texas and the Mississippi Valley; regions that suffer a smaller decline than the U.S. average are the Midwest, Northeast, and California. Losses in the Great Plains, Mid-Atlantic, and the Southeast are near the national average for the U.S. as a whole.

Figure 5: Projected regional distribution of changes to employment in 2030 due to ACES



Source: CRA Model Results, 2009

A region's industrial impacts, and hence employment effects, strongly correlate with the region's composition of industries and the energy-intensity of these industries. The Northeast and California fare better than other regions because of their initial economic circumstances. Namely, these regions' industries are less energy-intensive, as is the overall composition of industry. At the other end of the spectrum are the Mississippi Valley, Oklahoma/Texas and West regions, which are more concentrated in conventional energy production activities and energy-intensive industries.

Allocations of allowances have regional implications that are sometimes hidden within national results. For example, on a national level allowance allocations soften some of the impacts on household electricity bills until 2030, when the allowance allocations to electric LDCs are completely phased out. However, the allowance allocations still result in widely divergent regional impacts on household electricity *bills* and do not eliminate the significant differences in the percentage changes in regional electricity *rates*.

The results in the table and figures below are from the High case from our recent report on ACES. The High case results are in the middle of the results of the four cases we analyzed (Low, Reference, High and No International Offsets). However, each of the cases we analyzed exhibits a similar pattern.

Table 1: Summary Comparison of Regional Wealth, Declines in Purchasing Power and Electricity Bill (High Case)

Region Name	Baseline Income Level (Consumption per Household in 2010)	Decline in Purchasing Power ($/Household)		Increase in Household Electric Utility Bills	
		2020	2030	2020	2030
Northeast	$86,800	$1,500	$1,620	0.6%	12.3%
California	$86,300	$1,390	$1,440	10.5%	12.6%
Mid-Atlantic	$80,700	$1,310	$1,440	4.3%	21.4%
Midwest	$76,200	$1,760	$1,810	16.5%	47.2%
US Average	***$75,700***	***$1,620***	***$1,690***	***10.1%***	***29.3%***
Great Plains	$75,700	$2,280	$2,400	15.4%	38.5%
Mississippi Valley	$75,200	$1,340	$1,580	10.2%	36.3%
West	$74,000	$930	$500	12.3%	23.1%
Oklahoma/Texas	$66,800	$2,270	$2,490	7.6%	29.3%
Southeast	$66,800	$1,920	$2,090	15.0%	40.0%

The regions in Table 1 are ordered from highest to lowest baseline income levels. Table 1 shows a fairly wide range of baseline income across regions, with the Northeast and California having the highest levels and the Southeast and Oklahoma/Texas having the lowest levels. With ACES, the national average decline in purchasing power per household is $1,620 in 2020 ($1,690 in 2030), but is as little as $930 in the West in 2020 ($500 in the West in 2030) and as high as $2,270 in Oklahoma/Texas in 2020 ($2,490 in 2030, also in Oklahoma/Texas). This range of results is a function of the relative importance of different economic sectors across the regions and differences in each region's share of allowance allocations. Although the pattern is not always true, generally the largest declines in household purchasing power are occurring in the regions with the lowest baseline income levels.

Table 1 also shows the changes in household electric bills across the regions, *after accounting for the benefits of the allowance allocations to electricity LDCs*. In 2020, the average increase to household electric bills in the U.S. is 10.1% (29.3% in 2030), with the smallest increase of 0.6% in the Northeast (12.3% in the Northeast in 2030) and the largest increase of 16.5% in the Midwest (47.2% in the Midwest in 2030). A review of these results makes it clear that the allowance allocations do not result in an even distribution of the impacts on household electricity bills across the U.S. Again, the larger utility bill impacts tend to occur in the poorer regions. To achieve a more equitable percent impact distribution would require changes to the LDC allocation formula. However, some of the true diversity across individual utility companies is masked because of the still aggregate nature of the regions in Table 1. A more disaggregated analysis is therefore still needed.

Figure 6: Increases in Household Electricity Bills (High Case)

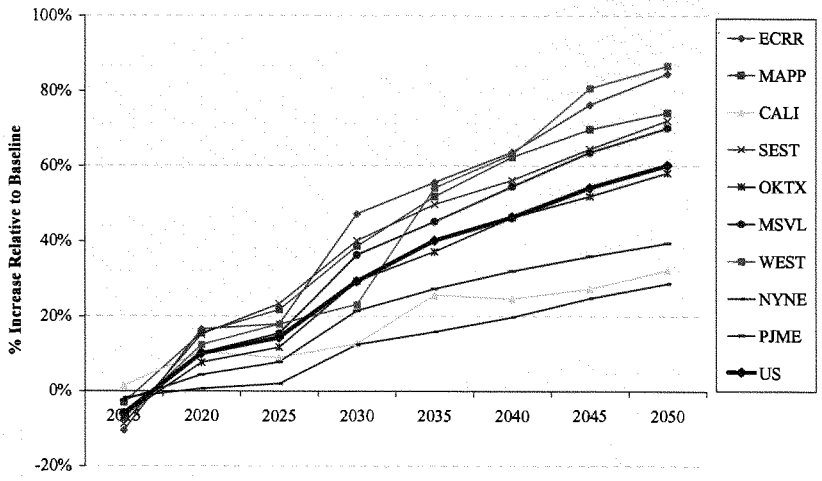
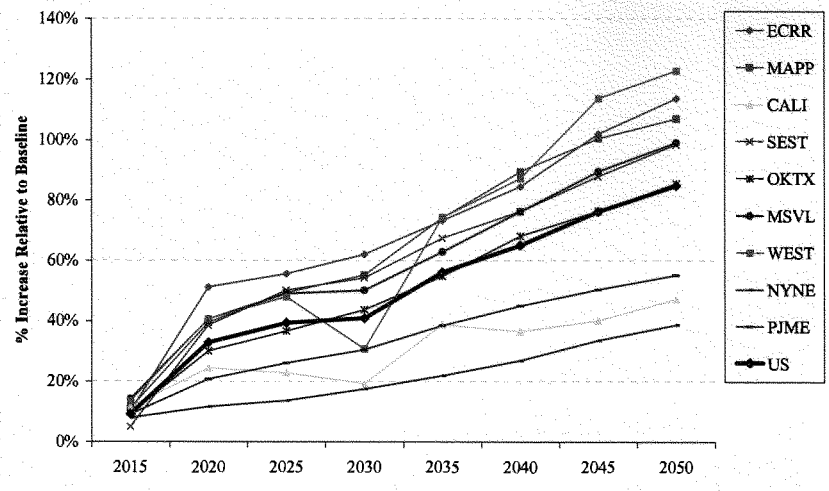


Figure 6 shows the regional distribution of increases in household electricity bills. The increases in the bills are reflective of allowance allocations to electricity LDCs, increases in electricity rates and changes in electricity demand in response to electricity rates. Figure 7 shows the regional distribution of increases in household electricity rates.

Figure 7: Increases in Household Electricity Rates (High Case)



International offsets are unlikely to be available in the amounts allowed by ACES, increasing the difficulty of insulating target groups from the costs impacts of ACES

ACES allows for up to 2 billion offsets per year to be used toward meeting the greenhouse gas cap. In our analysis of the bill (and in EPA's and the Congressional Budget Office's analysis of the bill), we all found that this quantity of offsets, *if readily available in the market*, would lead to CO_2 allowance prices in 2015 of $12 to $22 per metric ton.[3] All of the analyses also showed that if the international allowances are not at all available, for whatever reason, then the allowance prices in 2015 would instead be between $33 and $60 per metric ton. The higher CO_2 allowance prices would also translate to higher energy prices (electricity rate increases would be approximately double those with international offsets) and larger losses in household purchasing power (losses double without international offsets).

These findings highlight that the availability of international offsets is likely the most important uncertainty with respect to the cost of complying with ACES. The uncertainty is driven by the fact that while the international offsets are allowed, they are not mandated. As such, they may not actually materialize (particularly at the relatively low prices that we and EPA have assumed); or, many of them may simply not be approved for use.

[3] EPA's analysis is available at: http://www.epa.gov/climatechange/economics/economicanalyses.html#wax, and Congressional Budget Office's (CBO's) analysis is available at: http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf .

ACES specifies that regulations for the issuance of international offsets must be developed within two years of passage. Until there is clear regulatory guidance, offsets projects are unlikely to be initiated. Given that there is also a lag between project initiation and a supply of verified offsets from the project, this could severely limit the quantity of international offsets in the early years of the cap. Further, the requirements for international offsets specify that international offsets can only be issued if:

1. The U.S. is a party to a bi-lateral or multi-lateral arrangement with the country in which the offset project exists;
2. The country is a developing country; and
3. All other requirements of the regulations are met.[4]

The requirements for international avoided deforestation offsets are even more restrictive and require the capability to effectively monitor, measure, report and verify the reductions in emissions associated with avoided deforestation. To be eligible, a country must also not account for more than 1% of global greenhouse gas emissions and not more than 3% of global forest-sector and land use change greenhouse gas emissions.[5]

These steps may sound relatively simple, but they are not. On this topic, the CBO wrote,

> *"Based on information from the Department of State, EPA, and outside experts, CBO expects that the agreements necessary to generate offsets with certain countries would take significant time to negotiate. Over the period covered by this bill, the number of agreements and the scope of their coverage is assumed to increase. CBO also assumed that other developed countries (for example, those in the European Union) would seek offsets for their own emissions reduction programs, thereby reducing the supply available to U.S. entities."*[6]

Also, the International Institute for Environment and Development just released a study on systems of compensation for maintaining forest ecosystems. One of their primary findings is there is a definite need for effective and fair governance of forests (similar to that specified in ACES). However, the study found that in many of the countries with the highest rates of deforestation and forest degradation, governance is weak and is actually an underlying source of the deforestation and forest degradation.[7]

Even if these hurdles can be overcome, the recent push for international agreements makes the availability of these international offsets questionable. If the U.S. expects developing countries to commit to emission reduction in the near future then these countries would likely need to count the emission reductions from their forest activities

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[4] Sec. 743(b)(2).
[5] Sec. 743(e)(6)(A)(i).
[6] "H.R. 2454, American Clean Energy and Security Act of 2009," Congressional Budget Office, June 5, 2009, p. 16.
[7] "Incentives to sustain forest ecosystem services," International Institute for Environment and Development, June 2009.

toward meeting their own reduction requirements. Since a key hallmark of any offset is that it can only count once, then either it would count in the U.S. or in the country of the reduction, but not both. Further, with the pressures building across the world to adopt emission reductions there could be significant competition for purchasing these offsets, if they are made available outside of their country of origin.

Having fewer international offsets available will increase the emission reductions required domestically to get below the emission caps. In a free carbon market, international offsets will be purchased when they cost less than additional domestic emission reductions. Thus fewer international offsets will increase the cost of getting down to the cap, and in total this cost cannot be reduced by free allocations of allowances. Thus the higher carbon prices attributable to limited availability of international offsets will make it even more difficult to hold costs down for one group – such as utility ratepayers – without increasing costs even more for other groups and the general consumer.

How allowances are allocated or revenues from auctions are spent can have economic effects, but it depends on exactly how the allowance value is used

Many analysts have concluded that allowance allocations do not have any impact on economic costs, and they are *mostly* correct.[8] However, the exceptions to the rule can, and do, create economic distortions that can make these provisions costly additions to any bill. I will focus on three such exceptions, all of which are included in ACES:

1. Allowance allocations that reduce the cost of energy may diminish incentives for energy efficiency;
2. Output-based allowance allocations to industrials lead to uneconomical choices of the level of output; and
3. Technology subsidies lead to uneconomical choices of technologies.

Our cost analysis did not account for any of these distortions and their heightened project costs.

ACES includes allowance allocations to electricity local distribution companies. There is specific language on how these allowance allocations are to be used. The emission allowances may not be used "to provide any ratepayer a rebate that is based solely on the quantity of electricity delivered to such ratepayer."[9] The bill continues, "To the extent an electricity local distribution company uses the value … to provide rebates, it shall, to the maximum extent practicable, provide such rebates with regard to the fixed portion of ratepayers' bills."[10] This language reflects an understanding that if ratepayers do not see the higher costs in their bills associated with ACES compliance then they will not have

[8] I have made this point myself, in my original article on the theory of emission trading, "Markets in Licenses and Efficient Pollution Control Programs," Journal of Economic Theory Volume 5, Issue 3, December 1972, Pages 395-418.
[9] H.R. 2454, Part H, Sec. 783(b)(3)(C), page 559, May 15, 2009.
[10] *Ibid.*

an economic incentive to reduce their electricity consumption. While returning the value of allowances to consumers via fixed rebates would not lower their rates, it would lower ratepayer bills. For example, if an average consumer today consumes 700 kWh per month at a rate of $0.10 per kWh and then has other charges (taxes and surcharges) of another $20 then their monthly bill would be $90. Now assume that ACES is implemented and rates increase to $0.11 per kWh, other charges remain at $20, and there is a rebate associated with the allowance allocation of $5, resulting in a monthly bill of $92 assuming the same level of electricity demand. If consumers do not look at the increase in their electricity rates and their attention is drawn only if they observe a noticeable change in their monthly electricity bill, they may not understand that the policy has created increased returns to energy conservation, and, if so, the cost of complying with ACES will increase. (Our cost analysis did not account for this distortion and its heightened project costs.)[11]

The allocation to trade-exposed industries is based on a combination of direct and indirect carbon factors. The direct carbon factor is the product of the average output for the two preceding years and the average greenhouse gas emissions per unit of output for the industry. The indirect carbon factor also includes the average output for the two preceding years, but this figure is multiplied by an electricity emissions intensity factor and an electricity efficiency factor. Since industrial users control their level of output, by increasing their output they can gain more allowances in future years, even if the preferred level of output would be lower absent any allowance allocations. This distortion caused by the allowance allocation leads to higher output from the impacted industrials and therefore higher emissions, which puts more pressure on the rest of the economy to make emission reductions. This combination of factors increases the cost of complying with ACES. (Our cost analysis did not account for any of these distortions and their heightened project costs.)

ACES includes allowance allocations to assist in the deployment of carbon capture and sequestration (CCS) technology. The bill also allocates allowances to invest in renewable energy. The allowance allocation is targeted to specific technologies, CCS and renewables; other technologies (such as nuclear or not yet thought of technologies that also produce low or zero-carbon generation) do not receive any allowance allocations. This "picking of winners" can lead to an uneconomical choice of technology. For example, assume that, absent any allowance allocations to generation technologies, new nuclear generation would be a lower cost generating option than CCS and would therefore be selected by utilities to meet their demand requirements. With the allowance allocations, ACES is subsidizing a higher cost technology, CCS, which leads to the selection of CCS in place of the lower cost nuclear plant. The difference in the costs of these two plants (without any consideration of allowance allocations) represents an increase in the total costs of complying with ACES. (Our cost analysis did not account for any of these distortions and their heightened project costs.)

[11] The reductions from energy conservation and energy efficiency are a significant contributor to emissions abatement in our analysis of the bill and in EPA's preliminary analysis of the bill. Both analyses assume that consumers see the higher costs of energy and have an incentive to use less energy and use it more efficiently.

Regulatory provisions in the bill could make the cost to households much higher, and there is nothing either allocations or offsets can do about that

Important provisions in ACES (some of which neither our study nor any other have been able to model fully) are regulatory measures that go beyond the cap-and-trade program to require a certain percentage of electricity generation to come from renewable sources (included in CRA's analysis) and to mandate specific improvements in a number of standards for building energy efficiency, lighting and appliances. In our study, we concluded that in response to higher energy prices (including higher electricity rates), energy consumers would make extensive improvements in energy efficiency. As a result, our analysis finds about the same level efficiency improvement is achieved that is implicit in these mandates. However, much of that efficiency improvement would likely come from a different mix of actions than the specific mandated actions in ACES. ACES's mandates provisions will constrain the options of households and businesses as to how best to reduce their carbon footprints in light of the incentive provided by the cap-and-trade system.

Therefore, due to the renewable electricity standard and other efficiency mandates, the energy user (and electricity generator) may not be able to choose the most cost-effective technology or method to reduce their emissions. To the extent that the consumer and business person are the best judges of how to manage their own affairs and choose ways of dealing with higher energy prices, the regulatory measures in ACES will increase costs to the U.S. economy beyond what we have estimated.

No model can capture all these costs, because to do so would require as much information as the individual household or business has about its own affairs. Thus any attempt to quantify the costs of command-and-control regulations of this type is likely to significantly underestimate their costs, though even these regulations can be designed in ways that do more or less harm. Indeed, if it were possible to model all the costs of regulatory measures, there would be enough information centrally available that government regulators might actually have sufficient information to tell households and businesses how to do better jobs of managing their affairs. But government agencies do not, in fact, have any better information than analysts trying to assess costs of new legislation, so that neither is likely to understand the impacts of the kinds of mandates included in ACES. In contrast, a program that puts a uniform and predictable price on GHG emissions provides the incentive for households and businesses to use their own information and judgment to choose the most cost-effective ways to reduce emissions, and thereby to achieve the lowest possible cost for the economy as a whole.

The rationale of cap-and-trade is that it allows the market to select the lowest cost means, whatever they may be, for reaching a given GHG reduction target. By superimposing regulatory mandates on that system, Congress substitutes its own judgment for that of the market. When efficiency or other standards are binding, they would affect the allocation of abatement resources. They would compel industry to buy more renewable energy, say, or to invest more in CCS than it would otherwise do to comply with the total GHG cap. However, while the pattern of emission reductions would change, the total amount

reduced would not. The cap sets the total GHG cutback. If the regulations mandate more change in one area, less will take place somewhere else. Standards, therefore, can add costs but they will not add to the program's environmental benefits. They can only substitute more costly GHG cuts for those that could have been made at lower cost.

For the detailed standards mandated in Title II, it is impossible to tell by examining aggregate levels of energy efficiency whether or not the standards are binding. Even if the cap-and-trade program would be sufficient on its own to lead to similar or larger reductions in energy use in the specified sectors, the standards are very likely to mandate a different set of changes in energy use than consumers and businesses would choose on their own. This can only increase costs of complying with the overall cap, unless businesses and consumers are consistently making wrong decisions and the government agencies put in charge of the regulations can consistently make better decisions by substituting their regulatory authority for the decisions of those who know their own situations and alternatives.

The higher the costs of meeting the cap, the larger will be the costs imposed on those not protected by free allowance allocations

Allowance allocations cannot make costs disappear, but only move them around. In this statement, I have shown why I conclude that the particular mix of allocations in ACES does not appear to produce impacts of a comparable size across regions of the country. Further, my last three points addressed ways in which institutional barriers to the creation of valid international offsets, distortions caused by free allocations, and mandates programs can increase the unavoidable costs of a cap and trade program. These designed-in costs would be additional to the also irreducible uncertainty of costs that arises when uncertain future technology and consumer responses run into rigid caps on emissions. If costs of meeting the caps turn out higher than expected, for any of these reasons, the decision to insulate some groups from the impacts of the bill through free allocations will force the remainder of the economy – including in particular the general consumer – to face even higher costs.

Prepared for:

National Black Chamber of Commerce

Impact on the Economy of the American Clean Energy and Security Act of 2009 (H.R.2454)

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LIST OF ACRONYMS

ACESA - American Clean Energy and Security Act of 2009	FTE - Full-Time Equivalent
ACP - Alternative Compliance Payment	GDP - Gross Domestic Product
AEO - Annual Energy Outlook	GHG - Greenhouse Gas
BAU - Business As Usual	GW - Gigawatt
CAGR - Compound Annual Growth Rate	HHV - Higher Heating Value
CCS - Carbon Capture and Storage	kWh - Kilowatt-hour
CGE - Computable General Equilibrium	MMBtu - Million British Thermal Units
CRA - CRA International	MRN - Multi-Region National Model
EIA - Energy Information Administration	MS-MRT - Multi-Sector, Multi-Region Trade Model
EISA 2007 - Energy Independence and Security Act of 2007	NEEM - North American Electricity and Environment Model
EPA - Environmental Protection Agency	RES - Renewable Electricity Standard
EU-ETS - European Union Emissions Trading Scheme	VMT - Vehicle Miles Traveled
FOM - Fixed O&M	VOM - Variable O&M

DISCLAIMER

This report describes the conclusions of the individual authors and does not necessarily represent a position of CRA International or of its clients.

1. EXECUTIVE SUMMARY

CRA International (CRA) is a global consulting firm that has provided economic, financial, strategy and business management advice to public and private sector clients since 1965. CRA serves clients from offices on three continents.

As requested by the National Black Chamber of Commerce, CRA has used its proprietary, state-of-the-art MRN-NEEM and MS-MRT modeling systems to analyze the potential economic impacts of the proposed energy and climate legislation released by Reps. Waxman and Markey (hereafter referred to as American Clean Energy and Security Act of 2009, ACESA or H.R.2454)[1] currently being considered in the House Energy and Commerce Committee. This report is intended to help decision makers and the public understand some of the impacts the legislation could have on the U.S. economy and energy markets. These costs in turn need to be compared to the benefits of the specific proposal, and to the costs and benefits of alternatives, in order to make an informed policy choice.

To help with this comparison of approaches, the report also discusses alternative approaches that could increase or decrease the costs of meeting comparable environmental objectives. All projections in this analysis are based on the aforementioned CRA models, using publicly-available data for key input assumptions. The study examines key sections of the bill included in Title I – Clean Energy and Title III – Reducing Global Warming Pollution, particularly those provisions related to greenhouse gas (GHG) cap-and-trade, renewable energy, and offsets. The analysis focuses on how these could affect performance of the U.S. economy.

The most important conclusion is that, contrary to some claims that have been made recently, policies such as ACESA will have a cost.[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 United States alone are limited because of the relatively small share that the United States will contribute to global emissions over the next century.

This analysis reveals 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

[1] Bill released May 15, 2009.

[2] Claims to the contrary include, for example, House Speaker Nancy Pelosi's statement, "There should be no cost to the consumer." *Wall Street Journal*, April 24, 2009, in "Democrats Weigh Break for Utilities in Climate-Change Bill," Greg Hitt and Stephen Power, available at http://online.wsj.com/article/SB124050061773748291.html.

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.[3] Although the wise use of revenues from an auction or carbon tax can ameliorate impacts to 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 present analysis estimates, in terms of reductions in GDP and household consumption. Allocations do shift who bears the burden across industries, regions, and income groups, as do decisions about how to spend or return to taxpayers the revenues from allowance auctions.

Just as it is impossible to eliminate the cost of reducing emissions to levels consistent with the cap through allocations or revenue recycling, it is impossible to bring about a net increase in labor earnings through measures that impose a net cost on the economy. The present study finds 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" that would not exist in a no carbon policy world. However, any calculation of jobs created in these activities is incomplete if not supplemented with a calculation of the reduced employment in other industries and the decline in the average salary that would result from the associated higher energy costs and lower overall productivity in the economy. This study finds 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."

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. Full use of these international offsets would allow U.S. total emissions over the period from 2012 to 2050 to exceed the cap by about 30%.[4] The difference would be made up by paying for offsets that are deemed to represent emission reductions occurring in other countries. However, in light of the difficulties in measuring, verifying, and ensuring the permanence of these offsets, international negotiations have stressed domestic sources of emission reductions over international offsets. The actual rules to be developed for international offsets might allow far fewer than the authorized amount. This would drive costs up substantially.

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[3] Estimates of impacts on consumers are based on the assumption that all auction revenues are returned to households on a per capita basis and that the value of allocated allowances is also returned in the form of utility rebates and increased investment income from companies receiving allocations.

[4] If domestic offsets are not fully utilized thereby allowing international offsets to increase to as much as 1.5 billion tons per year then the effective increase in the cap from international offsets would exceed 30%.

An important set of provisions in the bill, some of which neither this analysis nor any other has been able to model fully, are regulatory measures that go beyond the cap-and-trade program to require a certain percentage of electricity generation to come from renewable sources (included in this analysis) and mandate specific improvements in a number of standards for building energy efficiency, lighting and appliances. This analysis includes extensive improvements in energy efficiency, consistent with the amount of efficiency improvement implicit in these mandates. However, much of that efficiency improvement may come from a different mix of actions than the specific mandated actions in ACESA. ACESA's mandates approach will constrain the options of households and businesses as to how best to reduce their carbon footprints in light of the incentive provided by the cap-and-trade system. Therefore, the energy user (and electricity generator) may not be able to choose the most cost-effective technology or method to reduce their emissions. To the extent that the consumer and business person are the best judges of how to manage their own affairs and choose ways of dealing with higher energy prices, the regulatory measures in ACESA will increase costs to the U.S. economy beyond what we have estimated.

No model can capture all these costs, because to do so would require as much information as the individual household or business has about its own affairs. Thus any attempt to quantify the costs of command-and-control regulations of this type is likely to significantly underestimate their costs, though even these regulations can be designed in ways that do more or less harm. Indeed, if it were possible to model all the costs of regulatory measures, there would be enough information centrally available that government regulators might actually have sufficient information to tell households and businesses how to do better jobs of managing their affairs. But government agencies do not, in fact, have any better information than analysts trying to assess costs of new legislation, so that neither is likely to understand the impacts of the kinds of mandates included in ACESA. In contrast, a program that puts a uniform and predictable price on GHG emissions provides the incentive for households and businesses to use their own information and judgment to choose the most cost-effective ways to reduce emissions, and thereby to achieve the lowest possible cost for the economy as a whole.

1.1 Economic Impacts

Specific economic impacts resulting from ACESA include the following:[5]

- Carbon Allowance Costs – 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 $22

[5] All costs in this report are expressed in terms of 2008 dollars, unless otherwise specified. 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). For GHG emissions the relevant measure is metric tons of CO_2e.

per metric ton of CO_2. By 2030, the allowance cost could increase to $46 per metric ton of CO_2 and by 2050, the allowance cost could reach $124 per metric ton of CO_2.

- Utility Rates and Utility Bills – Energy cost impacts consider the combined effect of changes in the prices of the fundamental energy commodities and the added cost of limiting carbon emissions. In the case of electricity and natural gas supplied through companies regulated by utility commissions, free allowance allocations will mitigate some of the total cost borne by retail customers. ACESA provides free allocations to such local distribution companies, but requires that the full cost of carbon still be reflected in the rates per unit of energy each customer uses. Relative to energy costs in the *Annual Energy Outlook (AEO) 2009* Baseline level, retail natural gas rates would rise by an estimated 10% ($1.20 per MMBtu) in 2015, by 16% ($2.30 per MMBtu) in 2030, and by 34% ($5.40 per MMBtu) in 2050. Retail electricity rates are estimated to increase by 7.3% (1.1 cents per kWh) relative to baseline levels in 2015, by 22% (2.8 cents per kWh) in 2030 and by 45% (6.1 cents per kWh) in 2050. 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*. Total utility bills may even decline in the first years of the policy if there is also substantial investment in end-use efficiency and/or conservation in response to the higher energy rates. We estimate that given the allocations in ACESA, average U.S. electricity utility bills would decline by about 0.5% in 2015, and then rise by about 4% to 5% in the 2020 to 2025 time period. Post-2025, as the allocations are phased out bills would rise more dramatically. We estimate that given the allocations in ACESA, average U.S. natural gas utility bills would increase by about 2.5% in 2015, and then rise by about 5% to 6% in the 2020 to 2025 time period, then rise more dramatically as the allocations are phased out.

- Transportation Fuel Costs - After an estimated 12 cents per gallon increase in 2015, costs of using motor fuels are estimated to increase by 5% (23 cents per gallon) in 2030 and increase by 11% (59 cents per gallon) in 2050, relative to baseline levels. These cost impacts consider the combined effect of changes in the market prices of the fundamental energy commodities, the added cost of limiting carbon emissions, and projected shifts towards a lower-carbon mix of energy sources used to fuel the average vehicle.

- Employment – A net reduction in U.S. employment of 2.3 million to 2.7 million jobs in each year of the policy through 2030. These reductions are net of substantial gains in "green jobs." While all regions of the country would be adversely impacted, the West, Oklahoma/Texas and the Mississippi Valley regions would be disproportionately affected.

- Wages – Declines in workers' wages will become more severe with time. The earnings of an average worker who remains employed would be approximately $170 less by 2015, $390 less by 2030, and $960 less by 2050, relative to baseline levels.

- Household Purchasing Power - The average American household's annual purchasing power is estimated to decline relative to the no carbon policy case by $730 in 2015, by $830 in 2030, and by $940 in 2050. These changes are calculated against 2010 income levels (the median U.S. household income in 2007 is approximately $50,000). They would be larger if stated against projected future baseline income levels.

- Overall Economic Activity - In 2015, gross domestic product (GDP), a commonly-used measure of total economic activity, is estimated to be 1.0% ($170 billon) below the baseline level driven principally by declining consumption. In 2030, GDP is estimated to be roughly 1.3% ($350 billon) below the baseline level. In 2050, GDP is estimated to be roughly 1.5% ($730 billon) below the baseline level.

1.2 Related Issues

Implementation of ACESA would result in a number of other significant issues:

- Uncertainty - Rigid caps on GHG emissions achieve certainty in the precise amount of emissions reductions over several decades, at the cost of large uncertainties about long-run carbon prices and costs to the economy, as well as short-term volatility in carbon prices. Policymakers have to decide how tightly to set a cap while the best estimates of cost to constituents differ by about a factor of two. The uncertainty and volatility also are deterrents to investment, because under different and equally plausible scenarios for carbon prices, investors will want to make different investment choices (*e.g.*, about new electric generation capacity). Potential volatility in carbon prices will impose risk-bearing costs on companies with a compliance obligation, and for industries like utilities and refineries the costs of managing trading risk could erode a significant percentage of their profit margin. Businesses and consumers already have to live with substantial volatility in commodities markets, such as for fuels. Companies are generally able to cope with unavoidable volatility in natural commodities; but that is no reason to intentionally create volatility in a new, major input (i.e., allowances) given that policymakers can establish the same carbon price incentive without any volatility at all. No matter how manageable carbon price volatility is, it has a cost, and no benefits are derived from that cost. Therefore, it is desirable to minimize carbon price volatility wherever possible. Carbon policy is one of the rare situations where carbon price volatility can be eliminated altogether while still having a clear price signal.

- Green jobs versus effects on total employment - Despite the promise of green jobs, ACESA would, if enacted, 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.

- R&D - Technology advances sufficient to achieve the Reference or Low Cost cases will only come with a much more effective commitment to R&D. The stimulus package and ACESA almost exclusively address deployment of known technologies and large-scale demonstration of well-developed new technologies, and do not provide the level of support for the types of basic and applied research necessary to create the breakthroughs on which game-changing technologies can be built.

- Costs of a duplicate regulatory system – ACESA establishes both a GHG cap-and-trade and a series of command-and-control mandates. In some cases, the regulations may not appear to be binding; *i.e.*, the cap might, by itself, motivate all of the actions needed to meet the standard. In these instances, the standards would waste resources on needless monitoring, measuring, enforcement, and compliance, but they would not affect the pattern of GHG reductions. In other cases, the standards would change the allocation of abatement resources by mandating different choices. However, the cap sets the total GHG cutback. If the regulations mandate more change in one area, less will take place somewhere else. Standards, therefore, will force the economy to substitute more expensive GHG emission decreases for decreases of the same amount that could have been made elsewhere at lower cost.

- Wealth transfers abroad - ACESA contains provisions that will transfer wealth from the U.S. to other nations. These include allocations of allowances to overseas entities for international adaptation and purchases of offsets from foreign projects. We estimate that these provisions of ACESA would result in a transfer of U.S wealth to other countries varying from $40 billion to $60 billion per year in the years 2012 through 2030. Some possible circumstances can cause these amounts to be even larger.

Overall, ACESA is designed to raise the cost of using conventional energy by requiring emission allowances for the use of that energy, which effectively restricts the use of lower cost energy in the U.S. economy. Higher energy costs would likely reduce total consumption, employment, and economic output. The link between energy supply and its cost, and economic performance is the key to understanding the pattern of the study results and central to an assessment of the implications of ACESA. Table 1-1 provides a summary of economic impacts.

Table 1-1: Summary of projected economic impacts (change from projected baseline)

	2015	2020	2030	2040	2050
CO_2 Allowance Price (2008$/metric ton)	$22	$28	$46	$74	$124
Change in U.S. jobs (Millions)	-2.3	-2.7	-2.5	-2.5	-3.0
Change to Average Worker's Annual Wages: *Assumes Partial Wage Adjustment* ($2008)	-$170	-$270	-$390	-$600	-$960
Change in U.S. Purchasing Power ($2008 per Household)	-$730	-$800	-$830	-$850	-$940
Percentage Change in U.S. GDP	-1.0%	-1.2%	-1.3 %	-1.3 %	-1.5%
Percentage Change in Natural Gas Retail Rates*	10% ($1.20/MMBtu)	14% ($1.60/MMBtu)	16% ($2.30/MMBtu)	25% ($3.70/MMBtu)	34% ($5.40/MMBtu)
Percentage Change in Motor Fuel Cost	3% (12¢/Gallon)	4% (14¢/Gallon)	5% (23¢/Gallon)	7% (37¢/Gallon)	11% (59¢/Gallon)
Percentage Change in Electricity Retail Rates*	7.3% (1.1¢/ kWh)	16% (2.0¢/ kWh)	22% (2.8¢/ kWh)	34% (4.5¢/ kWh)	45% (6.1¢/ kWh)

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

2. BACKGROUND

2.1 THE AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009

ACESA would, if enacted, impose sweeping changes on virtually all parts of the U.S. energy system. These changes would reverberate through much of the national economy. The two major provisions of the bill are a combined efficiency and renewable electricity standard and a greenhouse gas cap-and-trade system.

ACESA requires retail electric utilities to meet specified percentages of their annual load through renewable electricity generation and energy efficiency savings. The combined standard is initially set to 6% of load in 2012 and rises to a maximum of 20% by 2039. Up to one-quarter (or 5% of 2020 load) of the requirement can be met with savings from energy efficiency, and state governors can petition to increase the proportion of compliance met through energy efficiency to up to two-fifths of the combined percentage requirement. As an alternative to procuring renewable energy credits, retail electric utilities can purchase a $25 (adjusted for inflation) alternative compliance payment (ACP), the funds from which will flow back to state-led research and development of renewable electricity generation technologies and cost-effective energy efficiency programs.

Title III establishes a U.S. national cap on total GHG emissions. The cap would apply to electric utilities, oil companies, large industrial sources, and other covered entities. Entities covered by the act collectively contribute about 85% of U.S. greenhouse gas emissions, which are, in turn, approximately 17% of current global emissions. The program is designed to reduce covered emissions by 3% below 2005 levels in 2012, 17% below 2005 levels in 2020, 42% below 2005 levels in 2030, and 83% below 2005 levels in 2050.

Title III also provides for alternative compliance with the GHG emissions cap through offset credits and international emission allowances. However, it restricts the use of these measures. For international offset credits, an entity must submit five offset credits for every four tons of CO_2 that it emits, except for during the first five years of the cap. For international emission allowances, an entity may submit allowances issued by a foreign program that meets certain criteria. The total quantity of emissions that may be covered by rendering offsets to meet compliance obligations is limited to 2 billion metric tons of CO_2 in each year, split evenly between domestic and international offsets. Given the five offsets for four tons requirement for international offsets (after the first five years of the cap), this would mean that up to 2.25 billion offsets credits may be demanded under the cap each year.[6]

[6] In addition, if domestic offsets are not fully utilized, additional international offsets may be used (up to a total of 1.5 billion international offsets, but total offsets still cannot exceed 2 billion).

2.2 Provisions Modeled

The text of ACESA is more than 900 pages in length. The Congress has yet to fully determine some key features, making it impossible to model their impact. Many provisions that are provided have too little an economic impact, or their effect is too speculative, to warrant modeling. In other cases, provisions are economically consequential, but modeling them would require time and resource constraints that exceed those available for this initial effort. Detailed energy efficiency standards and mandates are consequential and are likely to raise costs and economic impacts if they change the decisions that households and businesses would make in response to the incentives created by the cap-and-trade program. However, modeling the full costs of these provisions requires a more detailed representation of individual decisions than any comprehensive economic model can encompass.

Thus, it is important to understand which aspects of ACESA have been addressed, which will be addressed later, and which lie beyond the scope of the analysis. Table 2-1 summarizes the primary provisions included in this analysis

Table 2-1: ACESA provisions modeled

Provision	Details
Combined efficiency and renewable electricity standard	Required specified percentages of a baseline level of electricity sales to be met with qualified renewable resources; baseline level excludes certain existing hydroelectric generation, sales from small LDCs and generation from new nuclear and carbon, capture and storage units
Greenhouse gas cap & trade	Cap on covered emissions from 2012-2050, allows banking/borrowing, annually allows for up to 2 billion in offsets (split between domestic and international offsets)
Allowances for carbon capture and storage (CCS)	Funds from allowances are used to bring online 3 GW of new CCS in 2020
Allocations provisions and revenue recycling	Regional and U.S. welfare impacts reflect ACESA's provisions for free allocations to industries and for investments in CCS and adaptation. All auctioned revenues are recycled to U.S. consumers.

Our analysis of the cap-and-trade program includes offset provisions, banking and borrowing, and the strategic reserve, all measures meant to ease the burdens expected to result from allowance price fluctuations. We have not included any of the costs of volatility in our estimates of the economic costs of the cap-and-trade program, either with or without these measures. Therefore, we are unable at this time to estimate how much these measures could reduce volatility or the costs that any remaining volatility would add to those estimated in this study.

Our analysis also estimates the impact of allowance allocations on the regional distribution of impacts and on average utility bills. These allowance allocations include free allocations to the electric sector, energy-intensive industries, natural gas distributors, automotive sector and refining sector. In addition, there are allocations made to spur investment in CCS, prevent tropical deforestation and aid in domestic and international adaptation. Remaining allowances are auctioned with proceeds being used to assist low and moderate-income households, assist states in increasing renewable energy and energy efficiency, increase research and development, assist workers and maintain budget neutrality. Our analysis also accounts for the full recycling of auction revenues in these ways.

2.3 Study Objectives

This study evaluates the potential economic consequences of the key provisions of ACESA. Because these provisions interact and because different elements of the economy are interconnected, the task requires the use of comprehensive and detailed economic models. These models simulate the operations of major features of the economy, so that it is possible to trace the many pathways through which legislation can affect various economic sectors and activities. CRA used its proprietary, state-of-the-art MRN-NEEM and MS-MRT modeling systems to analyze the potential impacts from ACESA on domestic energy markets and the economy. The models are described more fully in Appendix D.

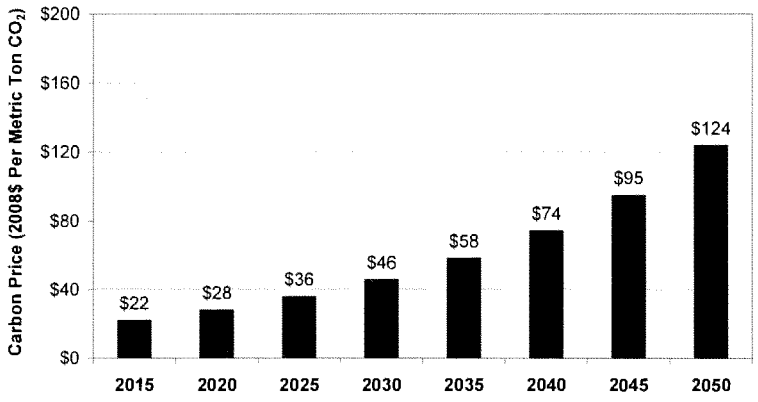
Like all other economic impact studies by EPA, EIA, and MIT, we assess only the costs of meeting the provisions of a policy, ACESA, in this case. These costs of the policy are to be compared to the benefits of whatever change in *global* atmospheric concentrations is projected to result from this single policy that affects U.S. emissions only. If a benefits calculation were to include emissions reductions from presently non-existent policies in other countries, then a different cost analysis would be required which would consider the additional costs on the U.S. economy of those additional assumed policies.

3. RESULTS

One of the primary objectives of ACESA is to implement a GHG cap-and-trade policy that would reduce greenhouse gas emissions by decreasing the use of conventional energy, which is carbon-emitting. This would be achieved by creating a limited supply of "allowances" required for the use of carbon-emitting energy, thereby increasing energy costs to the U.S. economy. As the cap progressively tightens with time (*i.e.*, allowances become scarcer), the marginal source of reducing emissions becomes more expensive as lower-cost sources of emissions reductions are exhausted. As a result, the price of an allowance increases with time as the cap becomes more stringent.

Figure 3.1 presents estimates of the CO_2 allowance price during the forecast period.[7] In 2015, the price of a carbon allowance is estimated to be $22 per metric ton of CO_2. By 2020, the allowance price would increase to $28 per metric ton of CO_2. By 2030, the allowance price would increase further to $46 per metric ton of CO_2. By 2050, the allowance price would reach $124 per metric ton of CO_2. The price pattern reflects the banking of permits that occurs in this policy. That is, permit prices increase by the annual discount rate of 5%.

Figure 3.1: Projected CO_2 allowance prices due to ACESA



Source: CRA Model Results, 2009

[7] All allowance prices are stated in terms of 2008 dollars per metric ton of CO_2e.

The economic impacts resulting from the increasing CO_2 allowance prices would be expected to cascade throughout the economy and would likely increase energy costs and decrease production and consumption across a wide array of goods and services. The size of the projected impacts varies by region but the direction does not. The projected impacts increase throughout the period analyzed (2010 through 2050) as the measures become more stringent, with the largest changes projected over the 2030 to 2050 time period.

3.1 Economic Impacts

3.1.1. Costs to consumers

Consumers ultimately bear the added costs projected to result from the cap-and-trade policy. The cap-and-trade provision is projected to result in fuel switching away from less costly conventional fuels (*e.g.*, coal), towards more costly lower carbon alternatives (including natural gas) due to tightening GHG emission caps. Further, costs for all carbon-based energy sources (*e.g.*, coal, oil, and natural gas) are projected to increase as allowances would need to be purchased for the emissions associated with the use of these fuels. In the case of electricity and natural gas supplied through companies regulated by utility commissions, free allowance allocations will mitigate some of the total cost borne by retail customers. ACESA provides free allowance allocations to such load-serving entities, but requires that the full cost of carbon still be reflected in the rates per unit of energy each customer uses. The ACESA allowance allocations are also accounted for in the impacts presented in this section.

Figure 3.2 reports how the cost per unit of energy consumed by businesses and households is projected to increase relative to energy costs in the AEO 2009 baseline level:[8]

- For transportation fuels, after an estimated 12 cents per gallon increase in 2015, costs of using motor fuels are estimated to increase by 5% (23 cents per gallon) in 2030 and increase by 11% (59 cents per gallon) in 2050 relative to baseline levels. These cost impacts consider the combined effect of changes in the market prices of the fundamental energy commodities, the added cost of limiting carbon emissions, and projected shifts towards a lower-carbon mix of energy sources used to fuel the average vehicle.
- Retail natural gas *rates* (*i.e.*, the price consumers pay per unit of gas energy used) would rise by an estimated 10% increase ($1.20 per MMBtu) by the year 2015, by 16% ($2.30 per MMBtu) by the year 2030, and by 34% ($5.40 per MMBtu) by the year 2050.

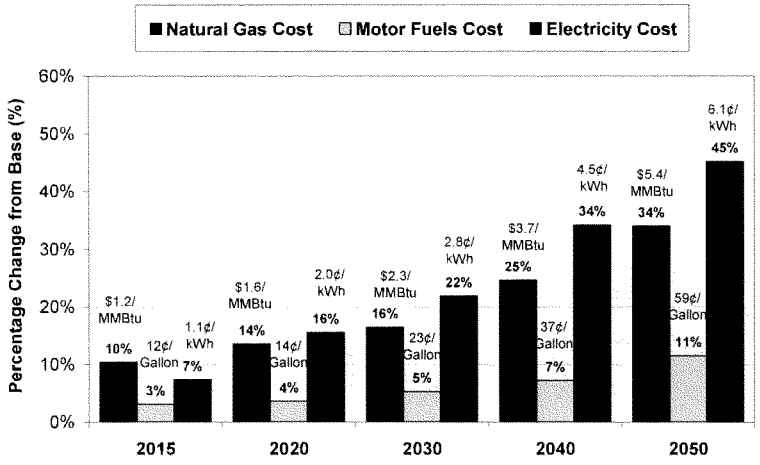
[8] Results herein are reported as changes from the EIA Annual Energy Outlook 2009 Early Release Reference Case.

- Retail electricity *rates* are estimated to increase by 7% (1.1 cents per kWh) relative to baseline levels in 2015, by 22% (2.8 cents per kWh) in 2030 and by 45% (6.1 cents per kWh) in 2050.

These increases in retail energy rates to customers of electricity and natural gas utilities are projected to occur even when accounting for ACESA's provision for free allocations of 30% of the allowances to electricity load-serving utilities, and 9% to gas utilities through 2025. This is because ACESA does not allow the value of those allocations to be returned to customers in proportion to the amount of energy that they use. The purpose of this provision is to ensure that consumers' incentives to conserve and to invest in energy efficiency are not undermined by attempts to mitigate their energy costs through free allocations. Instead, the allocation value will have to be returned to utility customers either through utility spending programs on energy efficiency or demand-side management, or through fixed rebates or credits on their bills. 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* will. Total utility bills may even decline in the first years of the policy if there is also substantial investment in end-use efficiency and/or conservation in response to the higher energy rates.

We estimate that given the allocations in ACESA, average U.S. electricity utility bills would decline by about 0.5% in 2015, and then rise by about 4% to 5% in the 2020 to 2025 time period. Post-2025, as the allocations are phased out, bills would rise more dramatically. We estimate that given the allocations in ACESA, average U.S. natural gas utility bills would increase by about 2.5% in 2015, and then rise by about 5% to 6% in the 2020 to 2025 time period, with more dramatic increases after that as the allocations are phased out.

Figure 3.2: Projected U.S. household increases in costs inclusive of carbon costs for natural gas, motor fuels and electricity due to ACESA, relative to baseline costs



Source: CRA Model Results, 2009

3.1.2. Investment, employment and productivity growth

Claims that GHG cap-and-trade can boost total employment have become commonplace. This contention has become a central point in the national debate about climate policy. That it has is understandable; the U.S. economy is undergoing both a cyclical downturn and a structural adjustment. Unemployment is high, and so is political pressure to respond to both the short-term cyclical and to the long-term structural aspects of the challenge. Not surprisingly, this pressure has led to claims and hopes that GHG cap-and-trade might somehow solve both problems.

These claims are incorrect, and the hopes that spring from them are destined to lead to disappointment. ACESA can have no impact on the unemployment arising from the current cyclical downturn because its provisions will not take effect soon enough. In the longer run, its net effects on employment will be negative, for the reasons explained in this section.

Investment diversion and impacts to productivity growth

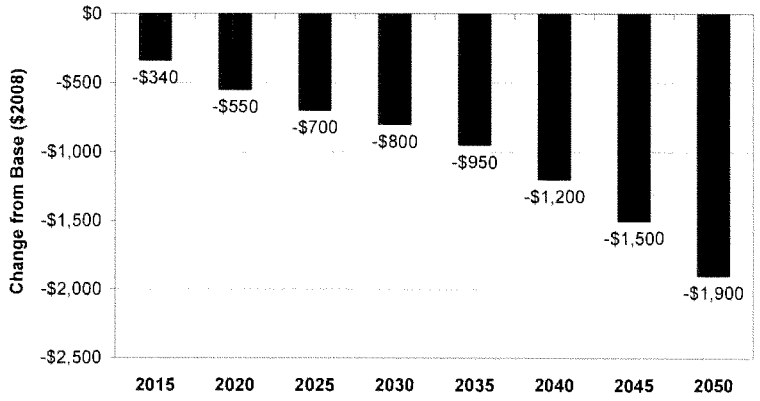
If enacted, ACESA would divert resources now used to produce goods and services into the task of obtaining energy from sources that are more costly than fossil fuels. If consumers and businesses are forced to spend more on energy due to its higher costs, they would have less to spend on other goods and services 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, the productivity of labor will fall. Business activity is likely to contract relative to the levels that would have prevailed without policy-induced energy cost hikes. The demand for labor would weaken because employers would 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 are projected to decline relative to that which would have prevailed without the higher energy costs. This will be reflected in a combination of less employment, and lower wages for those workers not losing their job.

Reductions in employment and wages due to reduced productivity growth

If actual wages were to decline to their lower equilibrium level instantaneously when the equilibrium wage rate falls as a result of the lower productivity caused by the policy, then full employment would remain in effect, but workers would immediately experience reduced incomes. Figure 3.3 presents the decline in the average annual salary paid to workers that would occur under an assumption that actual wages are fully responsive to the new, lower equilibrium wage rate.

Figure 3.3: Projected impact on average annual wages due to ACESA, assuming wage rates decrease instantly to lower equilibrium



Source: CRA Model Results, 2009

Empirical experience suggests, however, that wages do not immediately respond to new equilibrium levels, particularly if that entails a decline in wages. If real wages do not immediately fall to the new, lower market-clearing level, then there will be an excess supply of labor in the economy relative to what employers are willing to hire at those overly-high wage rates, and this leads to lay-offs and an increase in unemployment. The degree of

unemployment that will occur depends on how much wages actually do fall towards the new market-clearing level. An exceedingly high amount of unemployment would be estimated under ACESA if we were to assume that there would be no decline at all in real wages to the levels shown in Figure 3.3 above. And, as noted, if we assume that workers would immediately absorb the full wage decline shown in that figure, there would be no involuntary job losses.

Figure 3.4 illustrates the employment impacts if only half of the decline in the market-clearing wage rate is absorbed by workers immediately. In this case, the other half of the reduction in payments to labor has to be achieved by eliminating job positions. The actual number of job positions that would have to be shed depends on whether higher-paying or lower-paying jobs are the ones that are eliminated. In our calculation in the figure, we assume that jobs would be shed in equal proportions across the entire wage distribution, and report the loss in "average jobs." (The precise number of jobs would be lower if ACESA would disproportionately affect the relatively higher-paid positions, and it would be higher if ACESA would cause a disproportionate loss of lower-paid types of jobs.) Figure 3.4 shows that in 2015, the number of people on the unemployment rolls is estimated to be approximately 2.3 million higher than in the baseline. It also shows that there would remain between about 2.5 to 3 million fewer average jobs in the economy far into the future relative to what would otherwise have been possible but for the requirements of ACESA.

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 necessarily inclusive of all increases in so-called "green jobs" that will be created as a result of the proposed legislation.*[9]

Also, because these average losses in employment assume that workers do absorb some of the reductions in equilibrium payments to labor, there is still some depression in the average salaries to those who would retain their jobs. The decline in average annual wages that is consistent with the employment reductions in Figure 3.4 is shown in Figure 3.5.

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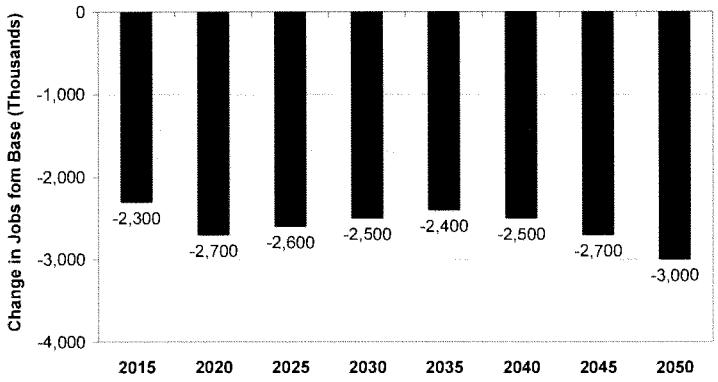
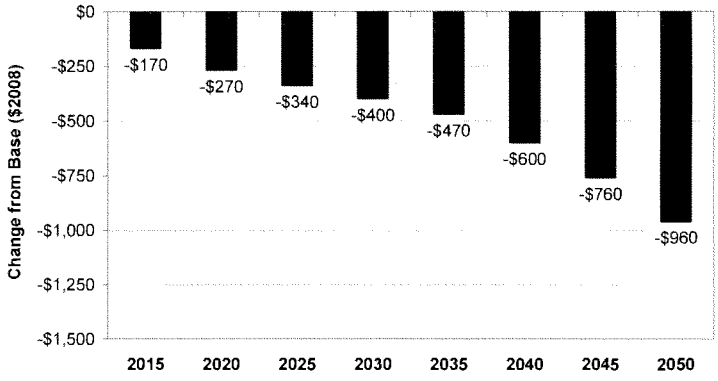
[9] CRA has made preliminary estimates of the number of average jobs directly associated with the increased payments to labor for increased renewable electricity, more efficient automobiles, biofuels, and energy efficiency improvements in its model scenario of ACESA. The preliminary estimate ranges from 1 million in 2015 to almost 2 million by 2030. The creation of a green job does not always mean the creation of a "new" job. For example, moving an autoworker from producing a vehicle powered by conventional fuels to a vehicle powered by a hybrid engine would not constitute a "new" job. Instead, it is a job transfer to what one might call a green job. Our estimate of green job creation includes green jobs that are both "new," which are incremental to a business as usual scenario, and "transfers," which are jobs shifted from part of an industry negatively impacted by a policy to another part of the industry that is positively impacted by the policy. Our net job loss estimates above are derived from the same model run that simultaneously contains this large number of implicit employment in "green jobs."

Figure 3.4: Projected changes to employment due to ACESA, assuming partial wage rate adjustments



Source: CRA Model Results, 2009

Figure 3.5: Projected impact on average annual wages due to ACESA for workers who remain employed, assuming partial wage rate adjustments

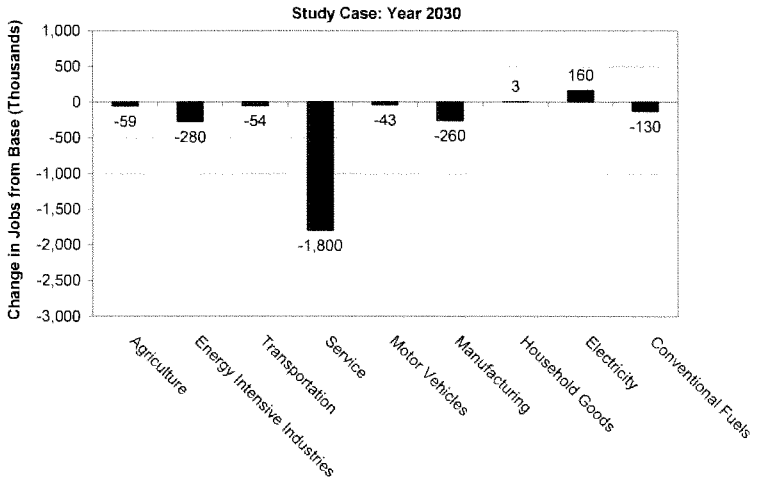


Source: CRA Model Results, 2009

It is noteworthy that the impact of a policy such as ACESA is not 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 growing the investment in more costly forms of energy, and this

will mean that payments to workers will remain lower for many decades than would be the case if we were to continue to rely on the cheaper but higher-carbon conventional sources of energy. The growing decline in real wages is due to a slowdown in productivity growth that is a direct consequence of the success of the cap-and-trade program in transforming the U.S. economy into one with nearly zero carbon emissions.

Figure 3.6: Projected impact by sector to employment in 2030 due to ACESA



Source: CRA Model Results, 2009

Employment impacts will also vary by industrial sector. Figure 3.6 shows the job loss in 2030 by sector. About 65% of the job losses that would accompany ACESA are projected to be in employment opportunities in the services and commercial sectors. Service sector employment reductions reflect the cumulative impact of businesses having to pay more for their energy services, and facing higher costs for goods and services generally, almost all of which are made using more expensive energy. These will tend to be "silent" losses of opportunity in the relatively low-wage portions of the economy that are least often associated with either the emitting sectors who will face the direct cost of the policy or the activities where the most overt examples of new "green jobs" will be found. Energy-intensive industries will also be affected as their competitiveness relative to other producers' declines due to the increases in energy costs. Conventional fuels decline because of reduced demand for fuels in general and the substitution to various forms of biofuels. The electricity sector gains as a result of the need to replace existing generation plants with zero and low carbon emitting technologies, and also due to general equilibrium effects.

Discussion of green jobs prospects

To be sure, by mandating the use of the newer, more expensive energy sources and systems ACESA would create some new jobs. The difficulty is that the number of these new "green jobs" will be lower than the number of the other jobs that the bill would destroy elsewhere in the economy. The apparent discrepancy between our finding and estimates of large numbers of green jobs arises because the latter estimates are answering the wrong question. Those who claim there will be a job-creating attribute to a policy such as ACESA have asked whether it will require workers to carry out energy efficiency projects and produce biofuels and build and operate power plants using renewable energy. It will, but it will also require that those workers come from employment in other industries, some of which are directly targeted by a cap-and-trade program – such as fossil fuels production – and some of which will shrink because consumers can no longer afford their full production. The question that we have addressed is whether the balance of the many economic effects of a GHG cap is to increase or decrease total labor income in the United States, and the answer is that total labor income will decrease.

Whether green jobs will be lower-paying than the jobs they replace and require more labor per unit of output does not change the generally depressing effect of the cap-and-trade program on total labor income. It might lead to two low-paid workers moving out of unemployment while one worker who was earning more than twice their wages becomes unemployed. Only if this were to be the predominant pattern of the impact of the policy could one argue that there would be a net increase in total jobs under the policy concomitant with the inevitable decrease in total payments to workers. Whether that would be a desirable goal of social policy cannot be answered by economic analysis.

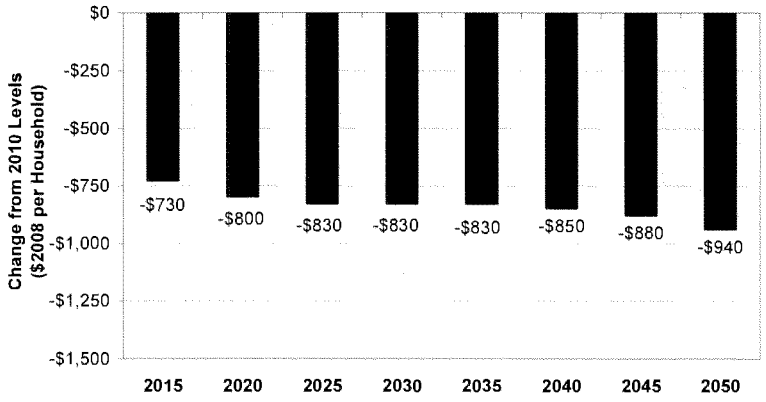
The debate is further confused by the lack of a clear definition of a "green job." For example, how would one classify a job supporting coal-fired power with carbon capture, or nuclear generation? How does one even tell if a given construction job is in "green" construction or not? Regardless of these definitional concerns, however, the fact remains that workers in aggregate will face lowered earnings potential under a policy that drives carbon emissions to much reduced levels. The net effect of lower productivity also ultimately translates into overall losses in average household spending power, and into reductions in GDP relative to what they would be if no such policy were in place. We turn to those cumulative macroeconomic effects in the next two sections.

3.1.3. Impacts on household consumption

Higher energy costs generally mean that consumers must spend a larger percentage of their income to maintain their current level of household energy services. At the same time, significant quantities of energy are needed to produce and transport the many non-energy goods and services. The projected higher costs of these goods and services would be expected to magnify the loss in household purchasing power associated with the direct purchase of energy services. At the same time, higher energy costs across the economy as

a whole would lower income. We have already discussed how average labor income would be reduced. Similarly, lower returns on investment would reduce household income from savings and retirement funds. Figure 3.7 shows the increasing erosion of household purchasing power that is projected as a result of ACESA, due to the combination of all these factors. These estimates of changes in household purchasing power are based on the assumption that all auction revenues are returned to households on a per capita basis and that the value of allocated allowances are also returned to households in the form of utility rebates and increased investment income from companies receiving allocations.

Figure 3.7: Projected impact on household purchasing power due to ACESA, stated in terms of 2010 income levels



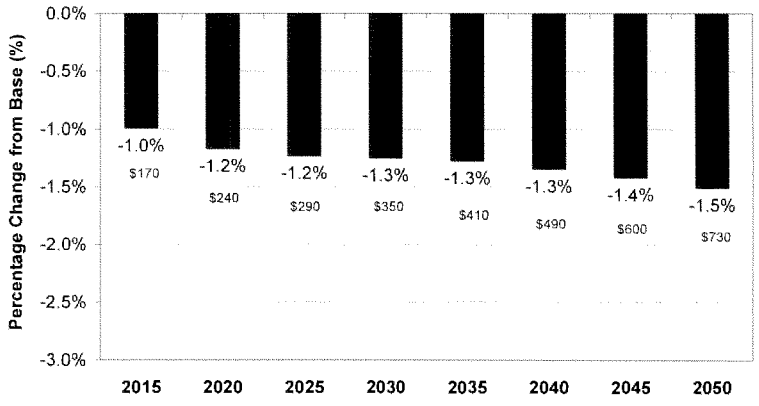
Source: CRA Model Results, 2009

Stated in terms of 2010 income levels, in 2015 the average household in the U.S. is estimated to experience a loss in purchasing power of roughly $730. This loss grows over time to $800 per household in 2020. In 2030, the estimated impact is projected to decline by roughly $830, and in 2050, the estimated impact reaches $940. A very large portion of the losses per household can be traced to the fact that a large fraction of total compliance is met by purchasing offsets from international sources. While these offsets lower the price of allowances, they also cause U.S. wealth to be given to other countries. More expensive compliance from domestic suppliers would at least keep that wealth from being transferred out of the pocketbooks of the average U.S. household.

3.1.4. Gross domestic product

The estimated impacts on GDP would follow the pattern already evident in the estimated results for consumption and employment. Higher production costs and lower household purchasing power interact; employment and consumption would fall; total economic activity, measured as GDP, would also decline. In 2015, the GDP is projected to decline by 1.0% ($170 billion) below the baseline level. In 2030, it is projected to decline further to 1.3% ($350 billion) below the baseline, reflecting the investment needed to build the infrastructure necessary to comply with future more stringent emission caps, and in 2050 the decline is 1.5% ($730 billion). Figure 3.8 illustrates the pattern of estimated GDP losses through time.

Figure 3.8: Projected impact on GDP due to ACESA, relative to the baseline

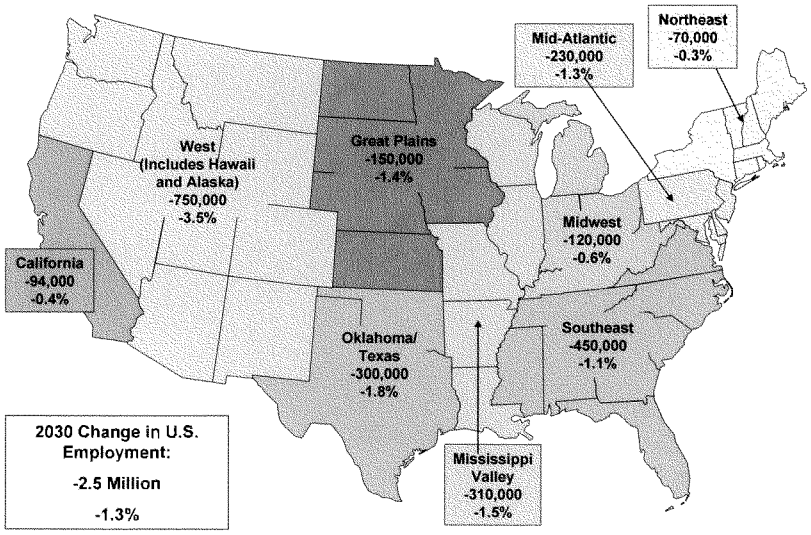


Source: CRA Model Results, 2009 *Values in Billions of $2008*

3.1.5. Impacts by Region

Figure 3.9 indicates that the projected job losses would be distributed throughout the country. Regions that experience a larger decline in employment relative to the U.S. average are the West, Oklahoma/Texas and the Mississippi Valley; regions that suffer a smaller decline than the U.S. average are the Midwest, Northeast, and California. Losses in the Great Plains, Mid-Atlantic, and the Southeast are near the national average for the U.S. as a whole.

Figure 3.9: Projected regional distribution of changes to employment in 2030 due to ACESA

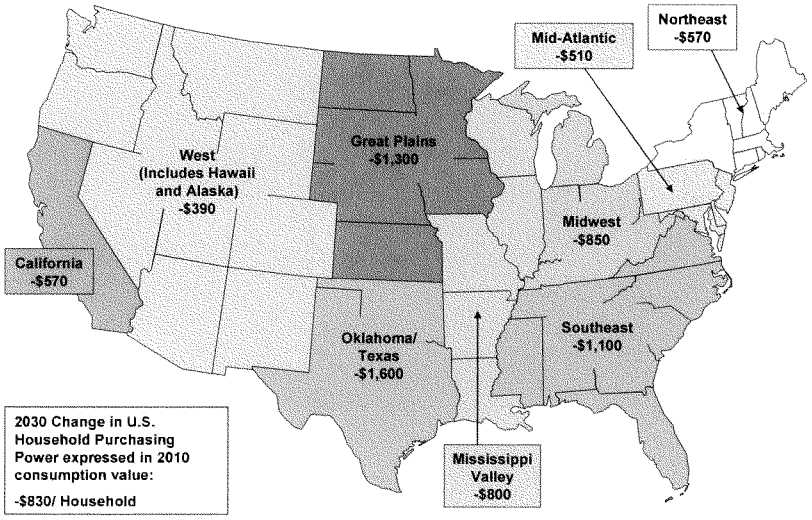


Source: CRA Model Results, 2009

A region's industrial impacts, and hence employment effects, strongly correlate with the region's composition of industries and the energy-intensity of these industries. The Northeast and California fare better than other regions because of their initial economic circumstances. Namely, these regions' industries are less energy-intensive, as is the overall composition of industry. At the other end of the spectrum are the Mississippi Valley, Oklahoma/Texas and West regions, which are more concentrated in conventional energy production activities and energy-intensive industries.

Figure 3.10 shows the loss in purchasing power by the regional household in 2030. Regions that experience a larger decline in purchasing power relative to the U.S. average are Oklahoma/Texas, Great Plains, and the Southeast; regions that suffer a smaller decline than the U.S. average are the West, California, Mid-Atlantic, and the Northeast. Losses in the Midwest and Mississippi Valley are near the national average for the U.S. as a whole. In general, households in regions that have to import higher-cost energy and those that face loss of domestic production incur the largest loss of purchasing power. (Changes in the regional distribution of permits could mitigate some of these disproportionate impacts, if designed effectively.)

Figure 3.10: Projected regional distribution of changes to 2030 household purchasing power due to ACESA, stated in terms of 2010 income levels



Source: CRA Model Results, 2009

Some of the distribution of regional impacts depends on the proposed permit allocation scheme. The West is an interesting case because it is on the low end of household impacts but on the high end in terms of job losses. This result illustrates the importance of permit allocations on welfare. The West receives a disproportionate share of the permits relative to its emissions. This wealth from permits mitigates this region's household impacts. The initial allocation of permits also greatly aids the Mid-Atlantic region. On the other end of the spectrum, the Great Plains region experiences greater household impacts because of its proportionately smaller allocation of emission allowances. These results highlight the great care that must be taken in deciding on the initial allocation of permits so that the policy equitably treats all concerned.

3.2 Uncertainties of Carbon Prices and Economic Impacts

Rigid caps on greenhouse gas emissions achieve certainty in emission levels over a period of time at the cost of large uncertainties about long-run carbon prices and costs to the economy, as well as short-term volatility in carbon prices.

3.2.1. Uncertainty about carbon prices and cost

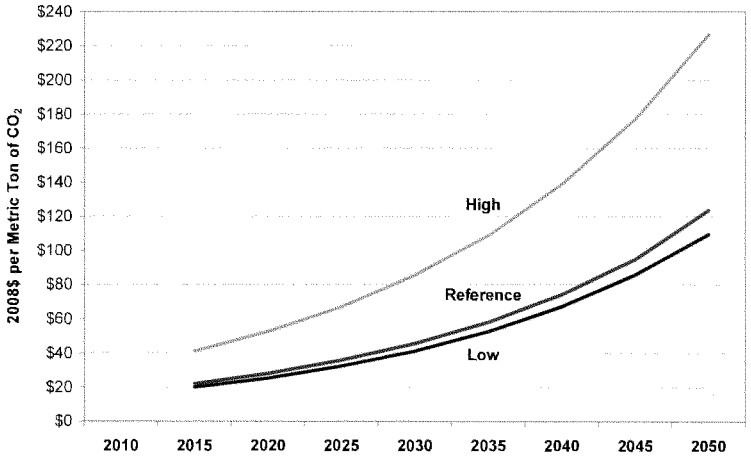
The uncertainty of outcomes from a rigid cap is illustrated by a pair of cases. These High and Low Cost cases were constructed by developing a range of assumptions about specific future economic and technology factors that will influence the level of carbon emissions and costs but cannot be predicted accurately in advance. Table 3-1 below describes the range of assumptions used to define the High and Low Cost cases, compared to Reference case assumptions.

Table 3-1: Range of assumptions in Low and High Cost cases compared to Reference case

	Low Cost	Reference	High Cost
Electricity Demand	AEO 2009 April Release (0.90% 2010-2030 CAGR)	AEO 2009 Early Release (1.00% 2010-2030 CAGR)	AEO 2009 Early Release + Difference b/w Early & April Release
Natural Gas Prices	Same as Reference	AEO 2009 Early Release through 2030, with a 2050 wellhead target of $9/MMBtu (in 2003$)	Same as reference
Demand Elasticity	Higher demand elasticity	CRA Standard	Lower demand elasticity
Low-Carbon Fuel Transportation Technology	Reduce zero- and low-carbon alternative fuels down to cost parity with motor gasoline	CRA Standard	Assume no zero-carbon fuel
Capital Costs for New Generating Technologies	Same as reference	AEO 2009 Early Release, save for nuclear (public filings) and geothermal (EPA NEEDS 2006)	Flat-line costs at first-year AEO 2009 Early Release
CCS Capacity Limits	270 GW by 2050	180 GW by 2050	Same as reference
Nuclear Capacity Limits	EPA W-M (266 GW by 2050)	206 GW by 2050	Allow existing nuclear fleet (103 GW) to be replaced, but no more
Offsets	Same as reference	Wealth transfers out of U.S. from international offset purchases priced at marginal cost of international offsets	Wealth transfers out of U.S. from international offset purchases priced at CO_2 allowance price, no international avoided deforestation offsets

Each of these factors represents a true uncertainty, about future growth in the economy and energy demand, about how energy use will respond to higher prices derived from the cap-and-trade system, about future developments in the performance and cost of electricity generation and transportation technologies, and about limits that may be imposed on key technologies due to regulatory action or litigation. These factors cannot be known in advance, and the assumptions chosen for the sensitivity analysis represent quite reasonable outcomes that many observers would see as likely. Figure 3.11 shows the range of carbon prices that this range of underlying uncertainty makes likely.

Figure 3.11: Carbon allowance prices by model scenario



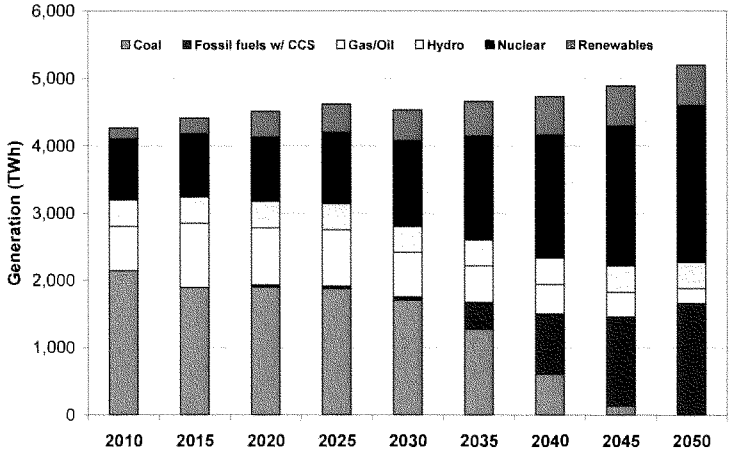
Source: CRA Model Results, 2009

The analysis reveals that the chance of higher prices and costs appears much larger than the chance of lower costs. In 2015 the High Cost assumptions lead to a carbon price about 90% higher than the Reference case, a percentage difference that is maintained out to 2050 because of the assumption that banking is utilized to minimize the overall cost of the cap. The Low Cost case only leads to carbon prices a few dollars lower, suggesting that the Reference case assumptions are about as favorable a set of relevant assumptions as it is possible to make about the factors considered, given current knowledge. (Some unanticipated, major breakthrough in technology might result in a lower cost than this range, but this would require very specific technology assumptions that are simply not justifiable with any current information. Such breakthroughs are unlikely without more emphasis on game-changing R&D than is found in ACESA and the stimulus package, which both concentrate on deployment of more mature technologies.)

Figure 3.12 and Figure 3.13 show differences in generation mix through 2050 and Figure 3.14 and Figure 3.15 show differences in technologies chosen for new capacity. The higher carbon allowance prices in the High Cost case (approximately double the carbon prices in the Low Cost case) call for considerably more renewables generation over the entire modeling horizon, and particularly for increased renewables investment from 2015 through 2020. The disparity in carbon allowance price projections makes investment planning for generators much more difficult in a cap-and-trade system that leaves future carbon allowance prices uncertain than it would be under an alternative, such as a carbon tax, that fixed the price in advance.[10] Investors who believed that carbon prices would follow the high track could find themselves with stranded renewable assets in the event lower carbon prices come about, and investors in other assets in the lower price cases could find themselves regretting the decision not to invest in renewables.

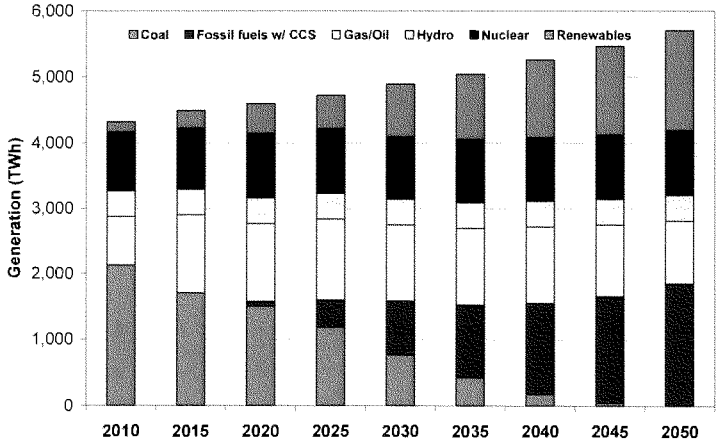
[10] Under a tax approach, there would also be uncertainties about long-run carbon price levels, because regulators would need to periodically reset the tax rate based on observed progress towards reducing emissions under initial tax rates. The tax policy approach offers short-term pricing stability, however, which helps with investment decisions, even though the long-term costs are unknown.

Figure 3.12: Generation by technology for the Low Cost case



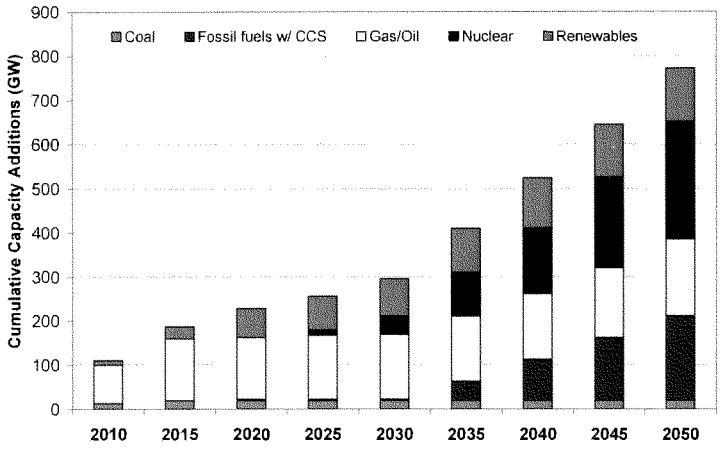
Source: CRA Model Results, 2009

Figure 3.13: Generation by technology for the High Cost case



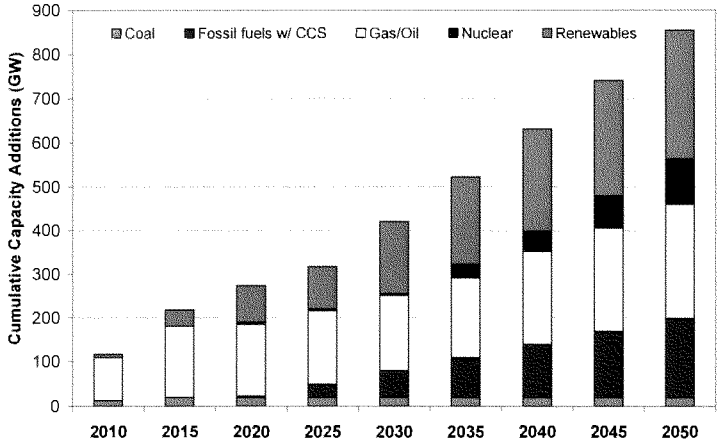
Source: CRA Model Results, 2009

Figure 3.14: Cumulative capacity additions by technology for the Low Cost case



Source: CRA Model Results, 2009

Figure 3.15: Cumulative capacity additions by technology for the High Cost case



Source: CRA Model Results, 2009

Moreover, investors' mistakes can contribute to volatility. If, for example, investors were convinced that carbon prices would remain at levels estimated in the Reference case for a decade, then they would build limited renewables. Later if it became clear that carbon prices were more similar to those in the High Cost case, then carbon prices could spike well above the estimated High Cost case levels until sufficient renewable generation is built to catch up with the High Cost case projection.

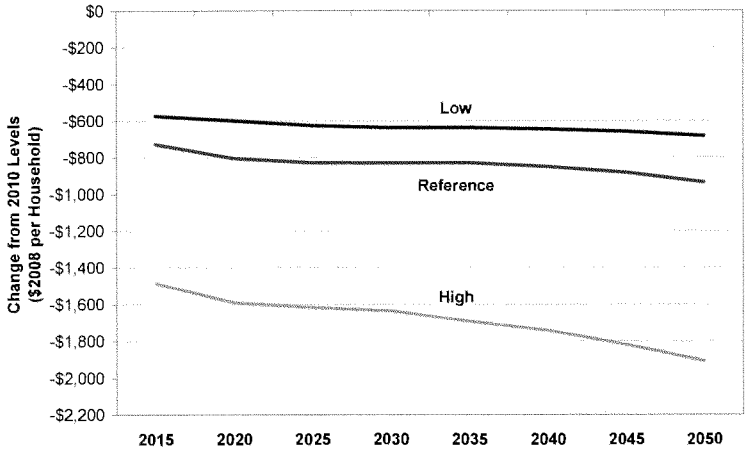
If, in contrast, the carbon price is known in advance – including how it can be expected to change many years into the future – covered emitters can plan compliance more easily and efficiently. They will be far more willing to undertake major capital investments in advanced, low-carbon technologies if they have some confidence that the carbon price level will either rise to or continue to remain at levels that make such investments cost-effective. They may also find it easier to obtain funding for such investments, if they are subject to less market risk.

The EU-ETS experience has also demonstrated that even very high carbon prices do not necessarily translate into a willingness of the private sector to make investments in new, lower-carbon technologies. Despite the fairly high average prices in the EU-ETS, there has been no serious degree of private sector investments in cleaner technologies.[11] The usual explanation for the failure of the EU-ETS to motivate investments in clean energy technologies is the uncertainty in its carbon price levels and the potential impermanence of the scheme. Even if investments in some clean technologies might be justifiable under the average carbon prices of about €20 per ton that have been experienced over the past four years, they have not been forthcoming. Uncertainty on what the carbon price level will be – not just for the next few years but for 10 to 20 years into the future – appears to be inhibiting private sector investments in low-carbon technologies.

[11] The fairly high rate of investment in renewables such as wind and solar in Germany is traceable to the very high guaranteed returns known as "feed-in tariffs" for such generation, and is not attributed to carbon prices.

Figure 3.16 shows the differences in household purchasing power under the three cases. These reveal that costs per household to meet the targets could be from $600 in the low case to $1,600 in the high case in 2020, depending on uncertain future developments. This is the kind of unavoidable uncertainty about impacts on their constituents that policymakers face in deciding on whether to adopt a cap-and-trade system and where to set the caps. Again, alternatives such as a carbon tax can greatly narrow the range of costs and economic impacts that a policymaker must deal with.

Figure 3.16: Impact on household purchasing power by model scenario based on 2010 consumption levels



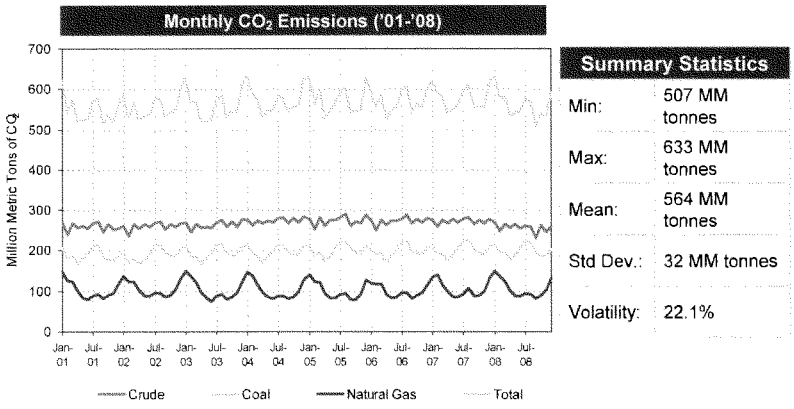
Source: CRA Model Results, 2009

3.2.2. Carbon price volatility

It is also quite likely that prices will move up and down within the range of possible futures, rather than settling down to one clear track after a few years. A major reason is that the banking provisions, relied on in many minds to reduce costs and uncertainty, themselves introduce significant additional uncertainty into near-term prices. Banking connects expected market conditions in the future to current willingness to pay for allowances, so that different or changing expectations about future technology costs, availability of offsets, or policy changes will be communicated immediately into current prices.

Carbon price volatility can also come from the normal factors that lead to swings in oil, natural gas and electricity demand and to volatility in refined product, natural gas and coal prices. Figure 3.17 shows monthly changes in emissions from oil, natural gas and coal consumption over the past decade, and the resulting monthly movements in total carbon emissions. This volatility in use is driven by changes in weather, overall economic activity, and fuel prices. These factors will continue to drive carbon emissions up and down unpredictably even with a cap on emissions, and carbon prices can be expected to rise when events that led to high CO_2 emissions in the past recur and to fall when events that led to low emissions occur. This volatility will be smoothed by the ability to bank allowances and by compliance periods of a year or more, but experience in other energy markets in which storage is possible, such as natural gas, and in Title IV sulfur dioxide markets demonstrates that even with such smoothing mechanisms volatility will appear.

Figure 3.17: Monthly CO_2 emissions from oil and gas and coal combustion



Source: Energy Information Administration, CRA Analysis

In all, a cap-and-trade program is effectively another market on which financial institutions can bet. Though the cap-and-trade program does not allow borrowing from the government, an over-the-counter market could conceivably arise where one could trade swaps and hence borrow. In addition, squeezes could occur near dates where entities need to true up their emissions and permits. All of this increases volatility and the costs of a cap-and-trade program.

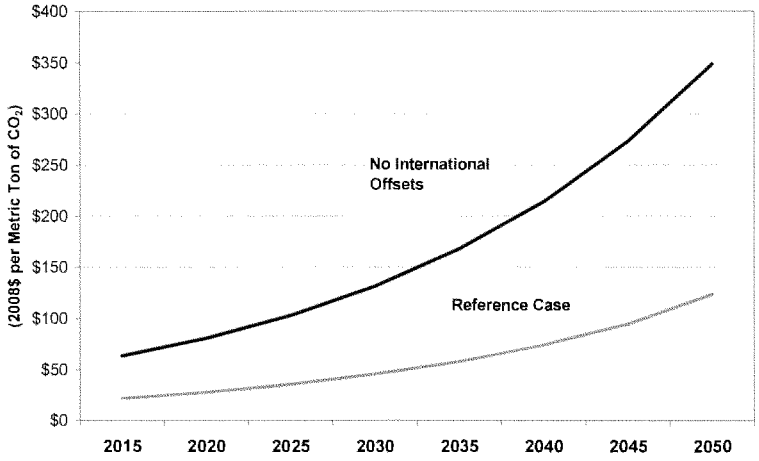
Businesses and consumers already have to live with substantial volatility in commodities markets, such as for fuels. Companies are generally able to cope with unavoidable volatility in natural commodities; but that is no reason to intentionally create volatility in a new, major input (i.e., allowances) given that policymakers can establish the same carbon price incentive without any volatility at all. No matter how manageable carbon price volatility is, it has a cost,

and no benefits are derived from that cost. Therefore, it is desirable to minimize carbon price volatility wherever possible. Carbon policy is one of the rare situations where price volatility can be eliminated altogether while still having a clear price signal.

3.2.3. Sensitivity: no international offsets

The cost and availability of international offsets is perhaps the most uncertain of all the factors influencing the cost of the policy. To understand how large a role international offsets play, we analyzed an alternative scenario to the Reference case in which no international offsets were allowed. Results from this scenario reveal that without use of the full amount of international offsets allowed by the bill, carbon prices would more than double. The reasons why international offsets might not be available at as low a cost and in as large quantities as assumed in the Reference case are discussed in Section 3.3.4.

Figure 3.18: Comparison of carbon allowance prices with and without international offsets



Source: CRA Model Results, 2009

3.2.4. Alternatives to reduce costs of uncertainty

The uncertainty of carbon prices under a cap-and-trade program imposes real economic costs. The uncertainty exemplified by the High and Low cases leads to an absence of clear signals for investors in low-carbon fuels and energy efficiency, as well as related R&D. This will slow progress toward developing efficient new technologies and raise overall economic costs.

Uncertainties that are expected to be resolved, such as rules implementing certain standards or offset calculations, could create a significant option value to an entity if it were to delay investments until uncertainties are reduced.[12]

There is also a potentially significant cost of bearing or mitigating the risks that carbon price volatility creates for companies with a compliance obligation. When companies need to buy allowances to cover their emissions, as with a full auction, their new expenditure may be large compared to their current net revenue. For example, the cash needed by an electricity generating company that has a diversified mix of coal, gas and zero-carbon generation similar to the U.S. average would face new outlays for allowance purchases of $35 per ton that are approximately 20% of its gross revenues, and perhaps 200% of its net revenues. Any delays in the pass-though of such costs to customers could seriously disrupt their financial position. Volatility exacerbates this situation by causing continual variations in cash flow needs. For example, fluctuation in the allowance price between $15 per ton and $50 per ton would mean that the cash flow requirements might vary from 85% to 350% of pre-policy cash flows. Even after price pass-through has occurred, delays in adjustments of the retail rates could translate into see-sawing profitability.[13]

Oil refiners, who are responsible for emissions from the fuels they sell and not just facility emissions, would be in a similar but probably more risky situation. Refiners could face even larger cash flow requirements relative to their profit margins to purchase their required allowances (refiners are to receive 2% of the total allowances from 2014 through 2026). Similarly, if a company has any substantial bank of allowances, it could face large swings in its balance sheet situation. Conditions such as these could translate into companies facing reduced credit ratings and more difficulties in raising capital. This possibility has not been studied at all yet, but certainly requires some careful investigation, including gaining an understanding of the extent to which trading in futures contracts and other derivatives could reduce risks, and what the cash flow and balance sheet effects of such trading might be.

Proposals to limit this uncertainty include safety valves and carbon taxes. A carbon tax would allow emissions to fluctuate year by year rather than prices and economic costs, but if chosen to match the Reference case carbon price would be expected to lead to the same cumulative emissions as the Reference case caps by 2050 (given the realization of other key assumptions). If uncertainties about some of the factors were reduced over time, such that it became clear that emissions were coming in higher or lower than expected at the chosen price, then the tax rate could be adjusted at intervals to aim for the desired cumulative emissions budget. Such tax rate adjustments would not be as disruptive to planning and operations as the volatility likely under a hard cap.

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[12] *Climate Policy Uncertainty and Investment Risk*, William Blyth, Ming Yang and Richard Bradley, International Energy Agency, 2007. Available at http://www.iea.org/textbase/nppdf/free/2007/Climate_Policy_Uncertainty.pdf.

[13] Smith, Anne E., "Auctioning under Cap and Trade: Design, Participation and Distribution of Revenues," Statement to the U.S. Senate Committee on Finance, May 7, 2009.

3.3 Discussion of Key Issues

3.3.1. Costs should be considered in relation to benefits

ACESA is estimated to raise domestic energy costs. The objective of the policy is to reduce greenhouse gas emissions by creating a mandated ceiling for these emissions. In so doing, it forces energy producers to either purchase allowances in order to continue to produce using their current practices or alter their production technologies through added costs in order to reduce their emissions. In either case, the cost of providing energy would increase and a portion of these costs would likely be borne by consumers.

The benefits of ACESA take the form of a reduced contribution of the United States to global concentrations of greenhouse gases, and the damages from climate change that these reduced concentrations would avoid. Because of the large share of GHG emissions over the next century that will come from other countries, particularly rapidly developing countries like China and India, any action by the U.S. will avoid only a small portion of the damages that have been attributed to global warming. The magnitude of the costs estimated in this study can only be judged to be large or small in comparison to these benefits, not by comparisons to other government programs.

3.3.2. Allowance allocations

This analysis includes the allowance allocation provisions in ACESA. Highlights include allocating 35% of allowances to the electricity sector, 15% of allowances to the energy-intensive industries, and smaller allocations to natural gas distributors, automotive companies and oil refiners. These allocations have a significant impact on the regional distribution of impacts, and could affect how regressive the overall impacts will be on different income groups.

Based on stated intentions in the bill, CRA's analysis has assumed that, except for allocations to industries, the value of all allowances would be rebated to households on a per capita basis. Allowances to oil refining, trade exposed industries, merchant coal generators, and the automobile industry serve to offset losses to businesses in those industries. Since any gains or losses ultimately affect share values, these amounts are assumed to be distributed among the population in proportion to ownership of financial assets, for which consumption is taken as a surrogate.

Changes in allowance allocations decisions will change the regional distribution of impacts, but will not materially change overall national economic impacts.

3.3.3. Costs of a duplicate regulatory system

ACESA establishes both a GHG cap-and-trade and a series of command-and-control mandates. The latter are, at best, redundant to the cap-and-trade. They regulate activities that are also subject to the proposed GHG cap. These include the RES and the coal-fired power plant performance standard, which are included in this analysis, as well as a series of more detailed and specific energy efficiency standards and programs that it was not possible to model due to their narrow application. The more detailed provisions are listed below:

TITLE II—ENERGY EFFICIENCY
Subtitle A—Building Energy Efficiency Programs
Sec. 201. Greater energy efficiency in building codes.
Sec. 202. Building retrofit program.
Sec. 203. Energy efficient manufactured homes.
Sec. 204. Building energy performance labeling program.

Subtitle B—Lighting and Appliance Energy Efficiency Programs
Sec. 211. Lighting efficiency standards.
Sec. 212. Other appliance efficiency standards.
Sec. 213. Appliance efficiency determinations and procedures.
Sec. 214. Best-in-Class Appliances Deployment Program.

Subtitle C—Transportation Efficiency
Sec. 221. Emissions standards.

PART B—MOBILE SOURCES
Sec. 821. Greenhouse gas emission standards for mobile sources.
Sec. 222. Greenhouse gas emissions reductions through transportation efficiency.

PART D—PLANNING REQUIREMENTS
Sec. 841. Greenhouse gas emissions reductions through transportation efficiency.
Sec. 223. SmartWay transportation efficiency program.
Sec. 822. SmartWay transportation efficiency program.
Sec. 224. State vehicle fleets.

Subtitle D—Industrial Energy Efficiency Programs
Sec. 241. Industrial plant energy efficiency standards.
Sec. 242. Electric and thermal waste energy recovery award program.
Sec. 243. Clarifying election of waste heat recovery financial incentives

The rationale of cap-and-trade is that it allows the market to select the lowest cost means, whatever they may be, for reaching a given GHG reduction target. By superimposing regulatory mandates on that system, Congress substitutes its own judgment for that of the market.

The provisions that were modeled, in particular the RES, appear to be binding only in a few years (*i.e.*, the cap might, by itself, motivate all of the actions needed to meet the standard). In these instances, the standards would have no effect on emissions. They would waste resources on needless monitoring, measuring, enforcement and compliance, but they would not affect the pattern of GHG reductions.

When efficiency or other standards are binding, they would affect the allocation of abatement resources. They would compel industry to buy more renewable energy, say, or to invest more in CCS than it would otherwise do to comply with the total GHG cap. However, while the pattern of emission reductions would change, the total amount reduced would not. The cap sets the total GHG cutback. If the regulations mandate more change in one area, less will take place somewhere else. Standards, therefore, can add costs but they will not add to the program's environmental benefits. They can only substitute more costly GHG cuts for those that could have been made at lower cost.

For the detailed standards mandated in Title II, it is impossible to tell by examining aggregate levels of energy efficiency whether or not the standards are binding. Even if the cap-and-trade program would be sufficient on its own to lead to similar or larger reductions in energy use in the specified sectors, the standards are very likely to mandate a different set of changes in energy use than consumers and businesses would choose on their own. This can only increase costs of complying with the overall cap, unless businesses and consumers are consistently making wrong decisions and the government agencies put in charge of the regulations can consistently make better decisions by substituting their regulatory authority for the decisions of those who know their own situations and alternatives.

These added costs are beyond what can be addressed in CRA's models -- or EPA's models used to produce their analysis of the draft Waxman-Markey bill -- at this point. But that implies that any bill including a significant number of detailed efficiency standards will have a cost greater than these modeling systems estimate.

3.3.4. Wealth transfers abroad

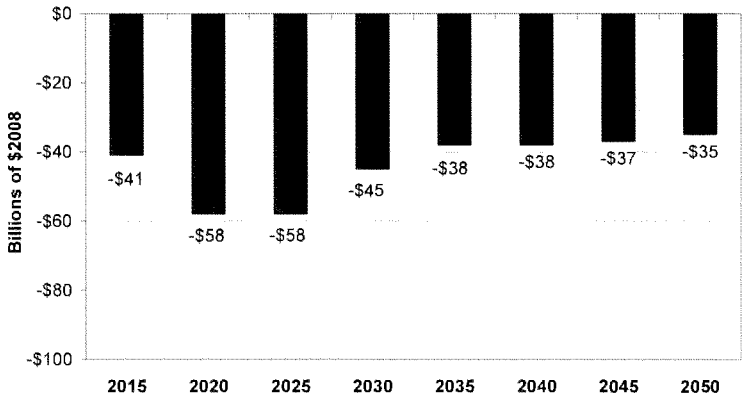
ACESA contains several provisions that entail wealth transfers from the U.S. to other nations. For example, it would sell "strategic reserve allowances" to covered entities, and use the revenues to purchase international offset credits issued for reduced deforestation. The strategic reserve will comprise 1% of each year's total allowance pool from 2012 through 2019, 2% of each year's total allowance pool from 2020 through 2029, and 3% of each year's total allowance pool from 2030 through 2050.

The bill mandates minimum auction prices for the strategic reserve allowances. In 2012 the minimum strategic reserve auction price will be double the EPA-modeled allowance price for that year. Minimum strategic reserve auction prices in 2013 and 2014 will rise by the rate of inflation plus 5%. For 2015 and thereafter, the minimum strategic reserve auction price will be 60% above the rolling 36-month average of the daily closing price for that year's allowances, calculated in constant dollars. EPA is to issue regulations governing both strategic reserve credits and private sector purchases of offsets.

The largest wealth transfers from the U.S. to other countries will be associated with purchases of international offsets. In effect, avoided deforestation becomes another U.S. import in an economy that has been struggling with a chronic structural trade deficit. As such, foreign offsets would be an added drag on U.S. terms of trade with the rest of the world. The

transfers that they entail lower the prices that U.S. exporters can obtain and raise the prices that Americans must pay for imports. The result is a further decline in U.S. standard of living that is reflected in the results reported in this study. The annual wealth transfer is shown in Figure 3.19.

Figure 3.19: Wealth transfer overseas from purchases of international offsets and internationally-allocated allowances under ACESA



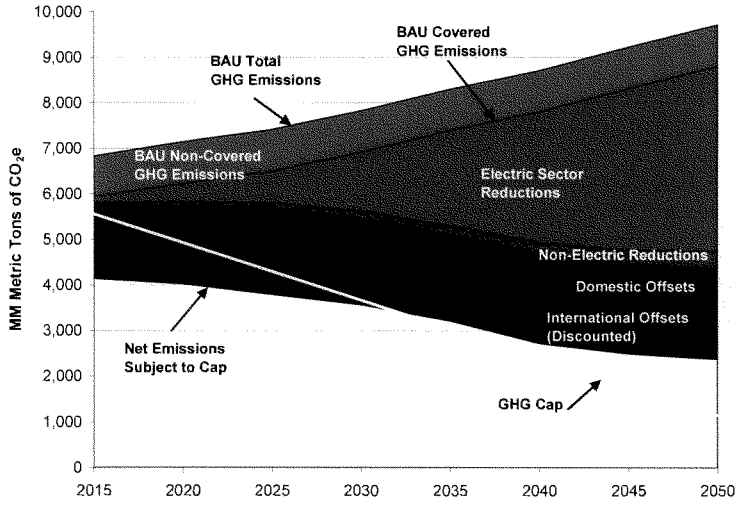
Source: CRA Model Results, 2009

While it is true that international offsets increase the potential supply of allowances and, hence, hold down allowance prices, the wealth transfer is a net loss to the U.S. Further, the bill's effective discounting of offsets, and the artificially high prices imposed on the strategic reserve allowance auction will rob offsets of much of their potential to control costs.

It is also possible that the U.S. will find it difficult to obtain the volume of offsets that this study estimates would be economic to purchase if their prices were reflective of only the cost of the associated emissions reduction projects in other countries. Based on experience in oil and mineral leasing, those countries that could sell permits are likely to want a substantial margin above cost to agree to supply offsets. That would increase the magnitude of wealth transfers, as well as the cost of meeting the domestic policy's requirements. One of the serious limits on production of oil resources worldwide is that in addition to insisting on a very large share of the economic rents from oil production, host countries are frequently politically unstable with unreliable legal systems, making long-term contracts difficult to rely on. Exactly the same conditions can be expected to prevail in many countries that could provide offset credits.

ACESA is so generous in its ceilings on international allowances that a significant amount of the required reduction will come from that source. Figure 3.20 shows the distribution of emission reductions between the electric sector, transportation, other energy use, domestic offsets and international offsets. International offsets provide 83% of the realized reduction in 2015, 36% in 2030 and 16% by 2050.

Figure 3.20: GHG emission reductions



Source: CRA Model Results, 2009

The large quantity of international offsets is at variance with the very strong sentiment in international negotiations – and reiterated in the most recent meetings of the ad hoc working group on long term cooperation – that developed countries should achieve most of their emission reductions through domestic measures. Combined with the observed wealth transfers and desire of host countries to maximize their take, the prospect of tightening the limits on international offsets seems plausible.

EPA regulation casts another cloud over offsets as a means of keeping policy costs down. Under ACESA, EPA would have a great deal of discretion to limit the effective supply of allowances. The effectiveness of measures to prevent deforestation and forest degradation are notoriously difficult to measure, and EPA may be very reluctant to (and face much external pressure not to) approve a very large share of the potential supply of these types of offsets that are assumed to be fully available in EPA's and our cost analyses.

Institutions greatly compound the scientific difficulties. In many developing countries, large disparities can exist between statute books and *de facto* practice. These disparities can cause gaps in the system of property rights. Thus, the ownership of forest land, let alone that of any value in the carbon content of standing trees, is often unclear.[14] There are often strong economic temptations to over-exploit resources that fall within lacunae in the system of property rights. Since governments can find it costly to define property rights and to enforce those that it has created, the task of curtailing this resource over-use is intractable.[15] In such cases laws intended to establish clear property rights and curb forest decline may have little real world effect. It would, then, not be surprising for EPA to adopt a highly skeptical attitude toward claims of avoided deforestation emissions. That stance, however, could well make forestry offsets very scarce despite the large potential for emission reduction that exists in principle. If this happens, estimated costs of ACESA would be greatly increased.

[14] Cotula, L. and Mayers, J., *Tenure in REDD – Start-point or afterthought?*, Natural Resource Issues No. 15. International Institute for Environment and Development, London, UK, 2009.

[15] Libecap, Gary D., "Contracting for Property Rights" in *Property Rights: Cooperation, Conflict and Law*, Terry L. Anderson and Fred S. McChesney editors, Princeton University Press, Princeton, 2003.

4. UNFINISHED BUSINESS

The results presented in this report represent our initial estimate of the economic impact resulting from ACESA. It represents our best efforts to model the provisions of the proposed legislation with the information and time available to us. At the time that we performed this analysis, information on the particulars of the proposed legislation was still evolving. Provisions of the bill are still being negotiated. When the bill becomes more definitive, we will review its final provisions and may revise this analysis.

In addition, there are a number of issues related to ACESA that are not included in this report due to time limitations, but which we hope to address in a follow-on report:

- We will extend the regional results by providing estimates of key state-level impacts.
- In a future report, we intend to analyze in more detail the uncertainty about carbon prices and costs that is inherent in any policy that sets rigid caps on emissions that must be met over a relatively short measurement period, and discuss the likely volatility of GHG allowance prices given the normal fluctuations in economic activity and energy supply.
- We also intend to estimate impacts by income group of the cap-and-trade program under different allocation systems and approaches to recycling auction or carbon tax revenues. We will also look at how these impacts vary by regions and the reasons for the variation.

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APPENDIX A: REPRESENTATION OF ACESA IN MRN-NEEM

This analysis measures the effects of certain provisions in the ACESA bill released by Reps. Waxman and Markey.[16] ACESA contains several provisions aimed at reducing emissions of greenhouse gases. This appendix describes the provisions of ACESA that we have modeled in this study.

ACESA includes several provisions aimed at reducing emissions of greenhouse gases. Some of these provisions are relatively well defined, while others only specify future regulations to be determined at a later date. This initial report focuses on two of the most important provisions of the proposed bill, including:

- Economy-wide cap-and-trade for greenhouse gases (GHGs) and
- Federal renewable electricity standard (RES).

A.1 A CAP-AND-TRADE POLICY FOR GREENHOUSE GASES

Title III of the proposed ACESA calls for imposition of an economy-wide cap-and-trade policy for GHGs. A cap-and-trade policy sets a total limit on emissions of GHGs. To legally emit GHGs that are subject to such a cap, a source must submit to the government a permit for each ton that it emits. In any given year, the government auctions or allocates only the number of greenhouse gas emission permits that equals the target set by the cap. Once the government has auctioned or allocated the emission permits, the permits can be freely traded among entities.

In the case of ACESA, the GHG cap would initially apply in 2012. At its onset, it would limit emissions to 3% below the level that had prevailed in 2005. By 2020, the cap on emissions would fall to 17% below the 2005 level, and by 2050, the cap on emissions would fall to 83% below the 2005 level. ACESA's cap-and-trade provisions include offsets and allow permits to be banked from one year to the next. The offsets provisions allow a quantity of offsets to be used to meet each emitter's compliance obligation. This annual offset limit is 2 billion tons, split evenly between domestic offsets and international offsets. There is a discounting of international offsets defined in the bill such that the purchase of 5 tons of offsets is allowed to meet 4 tons of compliance obligations (the discounting does not apply before 2018 and does not apply to domestic offsets). Therefore, nationally there would need to be purchases of 2.25 billion tons of offsets to achieve 2 billion tons of reductions from offsets.

[16] The version of the bill analyzed within this report is one that was released on May 15, 2009.

CRA has included these detailed offsets provisions in our analysis of ACESA. The analysis also includes unlimited banking of allowances.

Table A-1 includes the annual caps specified in the bill.

Table A-1: GHG cap (MM metric tons of CO_2)*

Year	Cap	Year	Cap	Year	Cap
2012	4,627	**2025**	4,294	**2038**	2,534
2013	4,544	**2026**	4,142	**2039**	2,409
2014	5,099	**2027**	3,990	**2040**	2,284
2015	5,003	**2028**	3,837	**2041**	2,159
2016	5,482	**2029**	3,685	**2042**	2,034
2017	5,375	**2030**	3,533	**2043**	1,910
2018	5,269	**2031**	3,408	**2044**	1,785
2019	5,162	**2032**	3,283	**2045**	1,660
2020	5,056	**2033**	3,158	**2046**	1,535
2021	5,903	**2034**	3,033	**2047**	1,410
2022	4,751	**2035**	2,908	**2048**	1,285
2023	4,599	**2036**	2,784	**2049**	1,160
2024	4,446	**2037**	2,659	**2050**	1,035

* CRA's MRN-NEEM models every five years and the first year in which the cap is in place in the model is 2015. In 2015, local distribution companies' emissions associated with natural gas are not covered, but coverage of these emissions begins in 2016. For simplicity, CRA has assumed that these emissions are covered in 2015. To account for this change in coverage we also increased the cap in 2015 to 5,589 MM metric tons, which was derived as the 2016 cap plus the change in the 2016 and 2017 caps.

A.2 Federal Renewable Electricity Standard

Title I of ACESA includes the establishment of a combined Federal RES and energy efficiency standard. The combined standard requires retail electricity suppliers to meet a certain percentage of their customer load with electricity generated from qualified renewables resources or from electricity savings gained through energy efficiency programs. This percentage increases from 6.0% in 2012 to 20.0% in 2020 through 2039, when the program ends.

The percentage requirement is applied to a base amount that is total sales less sales from non-qualified hydroelectric power and municipal solid waste. Also, smaller retail electricity suppliers (less than 4 million MWh) are not required to comply. The types of renewable resources that are eligible to meet the requirements include: wind energy, solar energy, geothermal energy, biomass/landfill gas, qualified hydropower, and marine/hydrokinetic

renewable energy. In addition, as new nuclear units and units with CCS are built their generation is also subtracted from the base amount.

In addition to the RES requirements, ACESA specifies an ACP whereby suppliers can purchase an ACP in lieu of holding a renewable energy credit. The price of the ACP is $25/MWh (in 2009$) growing with inflation. In addition, up to 25% of the requirement (*e.g.*, 5% of the 20% in 2020) can be met with energy efficiency savings. Table A-2 includes the annual percentage requirements that are applied to the base amount.

Table A-2: Federal renewable electricity standard

Year	% Requirement
2012-2013	6.0%
2014-2015[17]	9.5%
2016-2017	13.0%
2018-2019	16.5%
2020-2039	20.0%

A.3 Allowance Allocation Methodologies

ACESA specifies allowance allocations to certain sectors and groups to help in mitigating the cost increases they are likely to incur, while also assisting these industries in making a transition to a lower-carbon economy.

The electric sector is slated to receive 35% of the allowances through 2025, with the allowance allocation declining to 0% by 2030. This allocation is given to merchant coal-fired generators (5%) and local distribution companies (LDC). The allocation to local distribution companies is based on both sales and historical emissions. The LDC allocation cannot be used to reduce rates based on quantity of electricity consumed, but is intended to be used to rebate consumers based on some fixed portion of bills.

The other sectors that receive allocations are: energy-intensive industries, natural gas distributors, the automotive sector and oil refiners. All of these allocations decline to zero by 2030.

Allowances are also allocated to spur investments in CCS. In our analysis, these allowances help to bring about 3 GW of new CCS in 2020 and assist in the capital cost declines over time.

[17] In 2015, CRA modeled a 8.5% requirement, which was the requirement in the earlier March 31, 2009 draft of the bill, rather than a 9.5% requirement. The 8.5% requirement was not binding and it is unclear if increasing the requirement to 9.5% would result in a binding limit.

ACESA also specifies that some allowances are to be used to prevent tropical deforestation and assist in international adaptation. We have assumed that the value of these allowances would accrue to countries other than the United States, and therefore these dollars are wealth transfers from the United States.

Remaining allowances are allocated to a number of other areas including renewable energy and efficiency, research and development, low- and moderate income households, users of home heating oil, domestic adaptation, and worker assistance and job training. Also, any remaining allowances are used to ensure that ACESA is budget neutral. All of these allowances are grouped in Table A-3 as "Auction."

Table A-3: ACESA allowance allocations

	2015	2020	2025	2030	2035	2040	2045	2050
Total Electricity	35%	35%	35%	0%	0%	0%	0%	0%
Natural Gas	9%	9%	9%	0%	0%	0%	0%	0%
EIS Sector	15%	15%	15%	0%	0%	0%	0%	0%
Automotive Sector	3%	1%	1%	0%	0%	0%	0%	0%
Oil Refiners	2%	2%	2%	0%	0%	0%	0%	0%
CCS Investment	2%	5%	5%	5%	5%	5%	5%	5%
Preventing Tropical Deforestation	5%	5%	5%	3%	2%	2%	2%	2%
International Adaptation	1%	1%	2%	4%	4%	4%	4%	4%
Clean Technology Transfer	1%	1%	2%	4%	4%	4%	4%	4%
Auction	27%	26%	24%	84%	85%	85%	85%	85%
Total	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX B: BASELINE ASSUMPTIONS

The effects of the provisions that we have modeled are presented relative to a base case without any of these provisions. The base case is built upon many of the projections of the 2009 *Annual Energy Outlook* (AEO) Early Release produced by the Energy Information Administration (EIA) of the U.S. Department of Energy.[18] Several of the key baseline assumptions are described in this Appendix.

B.1 Cost and Performance Characteristics

The first-year technology capital cost assumptions (*i.e.*, the year in which a technology is first available) were based mainly on costs provided in EIA's AEO 2009 Electricity Market Module. In general, we found that EIA's capital costs assumptions for AEO 2009 fairly represented the capital costs being quoted in the trade press and in public filings. The exceptions were nuclear and geothermal. For nuclear, we relied upon capital cost data extracted from public filings that showed costs to be approximately 16% higher than EIA's estimates. For geothermal, we extracted data from Table 4.17 of EPA's NEEDS 2006 data source documentation, which provides capital cost by region and by potential capacity as opposed to the point estimate provided in EIA's Electricity Market Module. All capital costs include adders for fuel delivery infrastructure, transmission interconnection, and owners costs.[19]

For future capital costs, we trended costs downward to the AEO 2009 capital cost twenty years after the first-year. We then kept the technology's capital costs flat in subsequent years. For example, the first-year that Combined Cycle with CCS is available in MRN-NEEM is 2020. In 2040 and thereafter, the Combined Cycle with CCS capital costs are based upon the 2030 capital costs in AEO 2009 plus the adders described above (see Table B-1).

[18] Energy Information Administration, *Annual Energy Outlook 2009, Early Release with Projections to 2030*, prepared by U.S. Department of Energy, Energy Information Administration, December 2008.

[19] Owner's costs includes, but is not limited to land acquisition and right-of-way, permits and licensing, royalty allowances, economic development, project development costs, legal fees, and owner's engineering.

Table B-1: Total overnight capital costs excluding interest during construction (2008$/kW)

Technology	2010	2015	2020	2025	2030	2035	2040	2045	2050
Super Critical Pulverized Coal	2,404	2,296	2,187	2,079	1,970	1,970	1,970	1,970	1,970
IGCC	2,742	2,593	2,443	2,293	2,144	2,144	2,144	2,144	2,144
IGCC w/ CCS	N/A	N/A	3,952	3,711	3,470	3,229	2,988	2,988	2,988
Nuclear	N/A	N/A	4,800	4,625	4,450	4,275	4,100	4,100	4,100
Combustion Turbine	845	814	784	754	693	693	693	693	693
Combined Cycle	1,151	1,094	1,037	980	867	867	867	867	867
Combined Cycle w/ CCS	N/A	N/A	2,167	2,022	1,878	1,733	1,588	1,588	1,588
Biomass	4,265	3,988	3,711	3,435	2,881	2,881	2,881	2,881	2,881
Landfill Gas	3,082	2,948	2,813	2,678	2,408	2,408	2,408	2,408	2,408
Wind Cost Class 1-3	2,457	2,399	2,341	2,283	2,167	2,167	2,167	2,167	2,167
Wind Cost Class 4	3,932	3,839	3,746	3,653	3,467	3,467	3,467	3,467	3,467
Wind Offshore		4,590	4,339	4,087	3,836	3,585	3,585	3,585	3,585
Geothermal	Ranges from $3,155/kW to $8,783/kW depending on location								
Photovoltaic	6,228	5,706	5,184	4,663	4,141	4,141	4,141	4,141	4,141
Solar Thermal	6,034	5,732	5,430	5,129	4,827	4,827	4,827	4,827	4,827

Variable operating and maintenance (VOM) costs, fixed operating and maintenance (FOM) costs, and plant net heat rates on a higher heating value (HHV) basis are based mainly upon the AEO 2009 Early Release. FOM includes 'going-forward' costs that are required to maintain plant performance. For nuclear, we include levelized cost adders in the FOM for in-core carrying charges and for the spent nuclear fuel removal fee. The geothermal FOM is based on data from EPA NEEDS 2006. See Table B-2 which shows VOM, FOM, and heat rate assumptions by technology.

Table B-2: Operating and maintenance costs and plant efficiency

Technology	VOM (2008$/MWh)	FOM (2008$/kW-y)	Heat Rate – HHV (Btu/kWh)
Super Critical Pulverized Coal	4.4	41.8	9,200
IGCC	2.8	52.5	8,765
IGCC w/ CCS	4.3	62.0	10,781
Nuclear	0.5	111.8	10,434
Combustion Turbine	3.0	16.3	10,810
Combined Cycle	2.0	18.1	7,000
Combined Cycle w/ CCS	3.1	27.1	8,613
Biomass	7.1	83.3	13,000 (2010) 9,646 (2030)
Landfill Gas	0.0	109.6	13,648
Wind Cost Class 1-3	0.0	29.1	0
Wind Cost Class 4	0.0	29.1	0
Wind Offshore	0.0	94.3	0
Geothermal	0.0	134.3 – 292.1	0
Photovoltaic	0.0	11.2	0
Solar Thermal	0.0	54.5	0

B.2 Limits on Cumulative Capacity Additions

The cumulative capacity constraints in MRN-NEEM are based on a variety of public resources and CRA's own estimates and are shown in the table below. These limits serve as a ceiling on how much can be built over time as a matter of reasonableness. However, MRN-NEEM decides whether to build up to these limits, and may project much lower builds than these maxima.

Table B-3: Limits on U.S. cumulative capacity additions (GW)

Technology[20]	2010	2015	2020	2025	2030	2035	2040	2045	2050
SCPC and IGCC	12	30	90	150	210	270	330	390	450
Coal/gas with CCS	0	3	10	30	60	90	120	150	180
Nuclear	0	0	2	17	46	86	126	166	206
Offshore Wind	0	6	34	62	90	90	90	90	90
Total Wind	17	70	124	177	231	231	231	231	231
Biomass	6	33	60	87	113	113	113	113	113
Landfill Gas	0.3	2	3	4	5	5	5	5	5
Geothermal	1	3	6	10	15	15	15	15	15
Solar Thermal	No cumulative limits, but there are total capacity limits by region								
Photovoltaic	No cumulative limits, but there are total capacity limits by region								

[20] Sources of these capacity penetration rates are as follows: SCPC/IGCC (CRA), Coal/Gas with CCS (CRA and EPA analysis of Waxman-Markey), Nuclear (EPA analysis of Waxman-Markey), Offshore Wind (National Renewable Energy Lab), Total Wind (NREL, EIA, NYISO), Biomass (NREL, EIA), Landfill Gas (EPA NEEDS 2006), Geothermal (CRA), Solar Thermal (EPA NEEDS 2006), and Photovoltaic (CRA).

B.3 Other Major Input Assumptions

We calibrated our model baseline to closely match the outputs of EIA's *AEO 2009 Early Release*. The following table provides the major baseline indicators to which we calibrate:

Table B-4: Other major input assumptions

Indicator	Units	2010	2015	2020	2025	2030	2035	2040	2045	2050
Growth Rates										
GDP	%	2.0%	3.1%	2.5%	2.5%	2.7%	2.6%	2.6%	2.6%	2.6%
Electricity Demand	%	1.70%	0.88%	1.00%	1.00%	1.05%	1.02%	1.02%	1.02%	1.02%
Consumption										
Crude	Quads	34.6	33.8	32.1	31.9	33.0	33.9	34.8	36.4	36.9
Gas (Non-Electric Sector)	Quads	16.6	17.3	17.8	18.3	18.7	19.0	19.3	19.7	20.0
Oil	Quads	37.2	37.7	37.0	36.9	38.2	39.5	40.8	41.7	42.8
Transport Fuels	Quads	29.8	30.5	31.2	31.9	33.6	34.8	36.0	36.9	38.1
Driving Statistics										
VMT from Light Duty Vehicles (LDVs)	billions of miles	2,752	2,887	3,165	3,489	3,807	4,049	4,263	4,467	4,693
MPG of LDV Stock	MPG	20.3	21.9	25.0	29.0	32.2	33.4	34.1	35.1	36.5
Fuel Prices										
Natural Gas (Henry Hub)	2008$/MMBtu	$6.68	$7.06	$7.62	$8.25	$9.48	$9.98	$10.52	$11.08	$11.67
Natural Gas (Wellhead)	2008$/MMBtu	$5.90	$6.24	$6.73	$7.29	$8.37	$8.82	$9.29	$9.78	$10.30
Low Sulfur Crude	2008$/MMBtu	$13.41	$18.91	$19.89	$20.89	$22.44	$25.52	$29.03	$33.02	$37.56
Nuclear Fuel	2008$/MMBtu	$0.74	$0.74	$0.78	$0.81	$0.79	$0.79	$0.79	$0.79	$0.79
Biomass	2008$/MMBtu	$6.29	$6.29	$6.29	$6.29	$6.29	$6.29	$6.29	$6.29	$6.29
Coal	2008$/MMBtu	Computed endogenously in the model								

APPENDIX C: COMPARISON OF CRA RESULTS TO OTHER ANALYSES

At the time of this analysis there has been one other publicly-released, relevant analysis to which we can compare our results. EPA released an analysis of the cap-and-trade provisions of the draft Waxman-Markey bill.[21] EPA's study is based on the March 31, 2009 draft of the bill, which contains some slightly different provisions.

EPA's core analysis of the draft Waxman-Markey bill resulted in CO_2 allowance prices in 2015 of between $13 and $17 per metric ton of CO_2 (in 2005$). The high end of EPA's range of CO_2 allowance prices is only slightly below the CO_2 allowance prices in this study, based on the reference case assumptions.

This similarity in prices, however, is somewhat misleading. The provisions that EPA modeled within the cap-and-trade portion of the bill contain some important differences from the provisions modeled in this analysis. In particular, there are three key differences:

1. EPA's analysis did not include the RES provisions, which could lower their modeled allowance prices slightly.

2. The cap modeled by EPA is slightly tighter than that modeled in this study. H.R.2454 increased the cap in 2020 such that the cap is a 17% reduction from 2005 levels. This also changed the cap from 2012 through 2029. The cumulative cap from 2012 through 2050 in H.R.2454 is almost 2% higher than that in the draft Waxman-Markey bill that EPA modeled.

3. H.R.2454 includes a provision that allows for up to 1.5 billion metric tons of offsets from international sources, if domestic offsets are not fully utilized (up to 1 billion tons). In this analysis, this provision led to an increase in international offsets of 500 million metric tons in 2015 and 2020, 440 million metric tons in 2025 and 220 million metric tons in 2030. The availability of these international offsets effectively loosened the cap by almost 10% over the period from 2015 through 2030. This likely put significant downward pressure on the CO_2 prices in this analysis.

If EPA were to have modeled these three provisions as they are in H.R.2454, each would likely result in lower CO_2 allowance prices, and we would see a greater divergence between their CO_2 allowance prices and those included in this study. Therefore, it is important to understand the sources of the differences.

[21] EPA's study is available at: http://www.epa.gov/climatechange/economics/economicanalyses.html#wax.

On May 17, 2009, EPA released a qualitative assessment of the revisions to ACESA, relative to what they modeled. Their conclusion is, "On balance, compared to the draft bill, H.R. 2454 would likely result in lower allowance prices, a smaller impact on energy bills, and a smaller impact on household consumption, based on EPA's preliminary reading of the bill."[22] EPA focused on four areas that had changed to support their conclusion. The four areas of change are: 1) Cap level, 2) Offsets provisions, 3) Allowance allocations for protection from electricity price increases, and 4) Incentives for CCS. EPA did not list the RES provisions, which it did not model from the draft bill.

With respect to item 3, we believe that EPA has mischaracterized the provisions on the allowance allocations to electric local distribution companies. The specific provisions on the use of the allowances do not allow the use of the allowances for rebates based "solely on the quantity of electricity delivered to such ratepayer."[23] Since the rebate is not to be based on electricity use it should not distort the incentive for consumers to conserve electricity.

Both EPA's analysis and this analysis show significant reductions in the electric sector, limited reductions in the non-electric sectors and significant uptake of offsets (including the full utilization of international offsets in all years). CRA's analysis utilizes more domestic offsets than EPA.

A detailed review of EPA's results reveals the primary source of the difference leading to EPA's low CO_2 allowance prices. EPA's analysis was performed with two different economy-wide models – ADAGE and IGEM. EPA did sensitivity analysis using results from the ADAGE model so we will focus on that model. The ADAGE model is a similar model to CRA's older MRN model in that both are computable general equilibrium (CGE) models. ADAGE lacks a detailed technology representation of the electric sector. MRN suffered from the same problem and this weakness led CRA to develop the MRN-NEEM model which pairs the CGE framework for the non-electric sectors (MRN) with a detailed electric sector model (NEEM).

Without a detailed technology representation for the electric sector CGE models forecast too great of an ease of making reductions from the sector. This is demonstrated by EPA's own modeling. To validate its modeling of the electric sector, EPA took the CO_2 allowance prices and percentage changes in electricity demand and ran its detailed electric sector model, IPM.[24] EPA's analysis using the detailed technology representation (IPM) yields significantly

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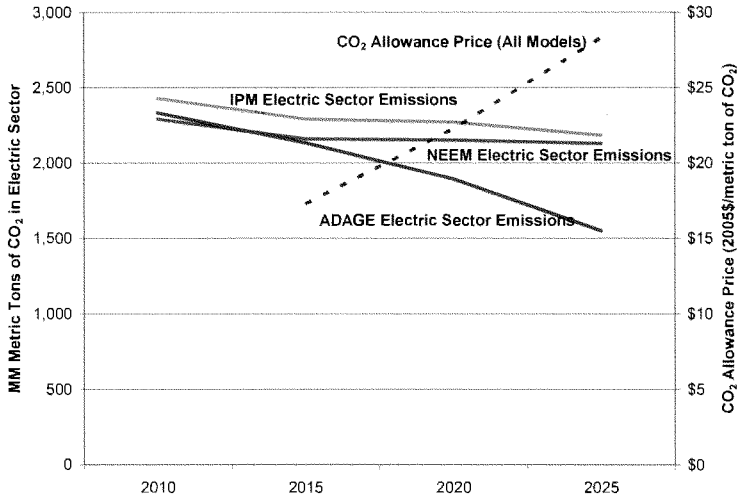
[22] "Ways in Which Revisions to the American Clean Energy and Security Act Change the Projected Economic Impacts of the Bill," U.S. EPA, May 17, 2009, available at: http://www.epa.gov/climatechange/economics/pdfs/EPAMemoonHR2454.pdf.

[23] H.R.2454, p. 559.

[24] See slides 19-25 in *EPA Preliminary Analysis of the Waxman-Markey Discussion Draft*, for a detailed discussion of EPA's approach.

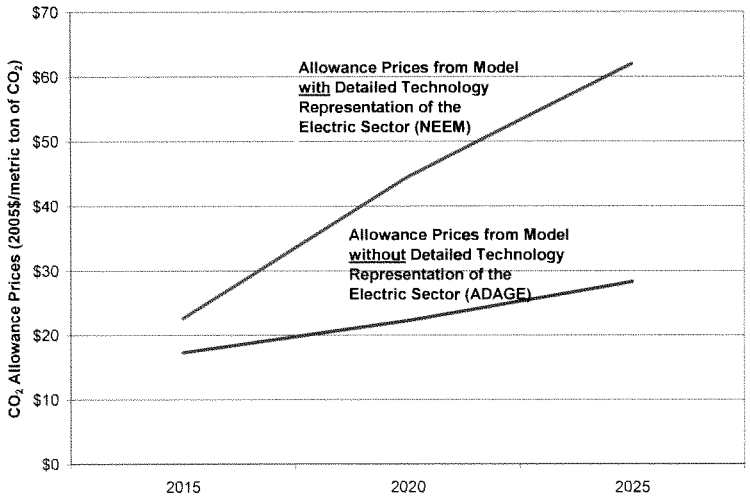
fewer CO_2 reductions from the electric sector as compared with a model without a detailed technology representation (ADAGE), at given CO_2 price levels. CRA used its NEEM model to do the same test that EPA did using IPM. We took the same CO_2 allowance prices and the percentage changes in electricity demand that EPA used in IPM. Our results were similar to those from EPA's analysis using IPM, as seen in Figure C.1. (Note that EPA's analysis using IPM only continued through 2025.)

Figure C.1: Comparison of electric sector emissions – ADAGE, IPM and NEEM



To evaluate just how much the ADAGE model might be overstating the ease with which electric sector reductions could be achieved, we used the resulting electric sector emissions from EPA's ADAGE analysis of the draft Waxman-Markey bill and implemented them as an electric sector cap in the NEEM model. Given the electric sector caps, NEEM then produced the marginal costs of abatement in the electric sector to achieve the level of electric sector emissions from ADAGE.

Figure C.2: Comparison of CO_2 allowance prices – ADAGE and NEEM



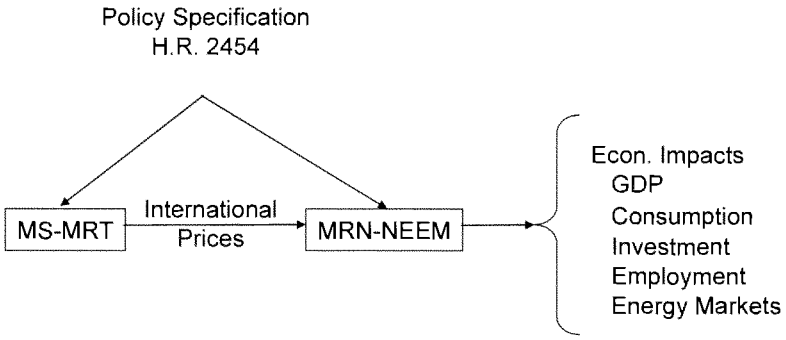
As seen in Figure C.2, the cost of achieving the electric sector emissions projected using ADAGE is significantly higher when evaluated with a model that contains a detailed technology representation of the electric sector. Thus, if EPA had coordinated its IPM and ADAGE models to produce consistent electric sector results, we would expect that EPA would have found significantly higher CO_2 prices for ACESA than they are currently reporting. Given that EPA says the IPM model is more "realistic" for the near-term, one can conclude that its ADAGE-based impact estimates are "not realistic" until they are made consistent with their IPM model projections.

APPENDIX D: MODEL DESCRIPTION

D.1 MODEL FRAMEWORK

In conducting this analysis for the National Black Chamber of Commerce, CRA combined three of its widely accepted state-of-the-art economic models: the Multi-Sector, Multi-Region Trade (MS-MRT) model, the Multi-Region National (MRN) model, and the North American Electricity and Environment Model (NEEM). The linked model approach accounts for the international feedback effects of the U.S. adopting ACESA. As Figure D.1 illustrates, MS-MRT is used to compute the effect on international prices from the U.S.'s adoption of ACESA. These prices are fed into the MRN-NEEM modeling system, which has a much more detailed representation of the U.S. economy and hence allows for more detailed analysis of the effects of ACESA.

Figure D.1: Linkage between MS-MRT and the MRN-NEEM modeling framework



This section briefly describes the three models: MS-MRT, MRN, and NEEM. It also provides more information on how the models are linked.

Overview of the MS-MRT sub-model

MS-MRT represents the entire world at an extremely aggregated level. It is built upon the GTAP6-IEA database,[25] which includes 83 countries/regions and 23 industries. For this project, we aggregated the dataset into the following regions: USA, Europe, Other OECD, Eastern Europe and Former Soviet Union, Middle East, China and India, high income East Asia, and the rest of the world. To be consistent with the MRN model, the dataset included the following sectors: coal, crude oil, electricity, natural gas, refined petroleum products, agriculture, energy-intensive sectors, manufacturing, services, and commercial transportation.

The model is fully dynamic, which means the agents in the model have perfect foresight and therefore perfectly anticipate all future policies. In other words, there are no surprises in the model, and saving and investment decisions are based on full inter-temporal optimization. MS-MRT belongs to the class of models referred to as general equilibrium.

Conceptually, as a fully dynamic general equilibrium model, the MS-MRT model computes a global equilibrium in which supply and demand are equated simultaneously in all markets for all time periods. There is a representative agent in each region, and goods are indexed by region and time. The incorporated budget constraint implies that there can be no change in any region's net foreign indebtedness over the time horizon of the model. Changes in the prices of internationally traded goods produce changes in the real terms of trade between regions. All markets clear simultaneously, so that agents correctly anticipate all future changes in terms of trade and take them into account in making saving and investment decisions. The model computes, among other variables, investment, industry output, changes in household welfare, gross domestic product, terms of trade, wage impacts, and commodity price changes.

In order to capture some of the short-run costs of adjustment, elasticities of substitution between different fuels and between energy and other goods vary with time. The model is benchmarked to assume baseline rates of economic growth based on official government statistics and a common rate of return on capital in all countries. The rate of growth in the effective labor force (population growth plus factor-augmenting technical progress) and the consumption discount rate are calibrated to be consistent both with the assumed rates of growth and return on capital, and with zero capital flows between regions on the balanced growth path.

ACESA was analyzed under the assumption that the U.S. economy would evolve in accordance with the Energy Information Agency's *Annual Energy Outlook 2009*'s reference case. These forecasts provide the baseline growth rate, energy consumption, energy

[25] Dimaranan, Betina V., "The GTAP 6 Data Base: (Global Trade, Assistance, and Production)." Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, December 2006.

production, and energy prices to which the model is benchmarked. The macro economic sub-model MS-MRT is benchmarked to the same economic forecast used in the MRN sub-model to maintain consistency between the models.

MS-MRT includes the markets for three fossil fuels and their products. Electricity and all other non-energy sectors (*e.g.*, agriculture) are produced using these fuels, capital, labor, electricity, and materials as inputs. The model allows for complete bilateral trade in all goods produced by all industries.[26] The MS-MRT model uses an Armington structure in its representation of international trade in all goods except crude oil, which is treated as a homogeneous good perfectly substitutable across regions. The Armington structure assumes that domestically produced goods and imports from every other region are differentiated products. Domestic goods and imports are combined into Armington aggregates, which then function as inputs into production or consumption.

Because crude oil is treated as a homogeneous good, it trades internationally under a single world price. Conversely, representing natural gas and coal as Armington goods allows the model to approximate the effects of infrastructure requirements and high transportation costs between some regions. World supply and demand determine the world price of fossil fuels in the model. Current taxes and subsidies are included in each country's prices.

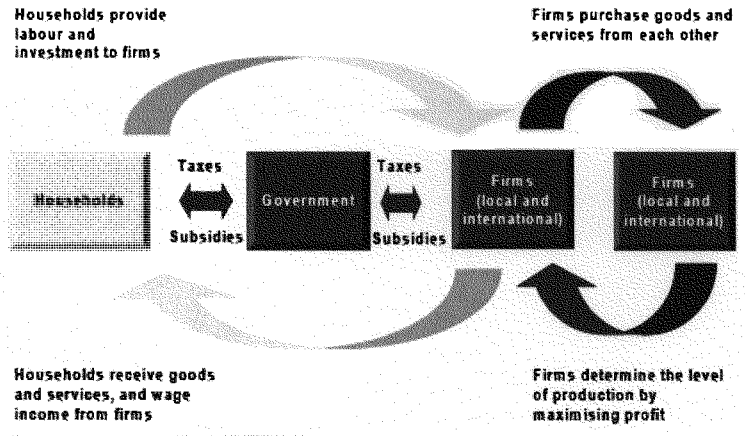
MRN-NEEM accounts for the added costs to U.S. refiners of the requirement that U.S. refineries hold allowances to cover their direct GHG emissions. This creates a competitive disadvantage relative to foreign refineries in countries not subject to emission limits. Since refined product imports are treated as Armington goods in the CRA model, that cost disadvantage does not lead to wholesale shutdown of U.S. refineries. If it were possible to obtain refined product imports meeting U.S. standards at a constant price lower than the cost of continued operation of U.S. refineries, there could be a larger switch from crude oil imports to refined product imports and further loss of jobs in the refining industry.

Overview of the MRN sub-model

The top-down component of the integrated MRN-NEEM model is tailored from CRA International's Multi-Region National (MRN) model, which is similar to MS-MRT in structure. MRN is a forward-looking, dynamic computable general equilibrium (CGE) model of the United States. It is based on the theoretical concept of an equilibrium in which macro-level outcomes (*e.g.*, consumption and investment) are driven by the decisions of self-interested consumers and producers. The basic structure of CGE models, such as MRN, is built around a circular flow of goods and payments between households, firms, and the government, as illustrated in Figure D.2.

[26] Where the data show no trade in a particular good occurs between two regions, such as electricity between Europe and the U.S., the model ensures that no trade can occur in the future.

Figure D.2: Circular flow of goods and services and payment figure



Overview of the NEEM sub-model

The North American Electricity and Environment Model (NEEM) fills the need for a flexible, bottom-up partial equilibrium model of the North American electricity market that can simultaneously model both system expansion and environmental compliance over a 50-year time frame.

The model employs detailed unit-level information on all of the generating units in the United States and large portions of Canada. In general, coal units over 200 MW are represented individually in the model, and other unit types are aggregated. NEEM models the evolution of the North American power system, taking account of demand growth, available generation, environmental technologies, and environmental regulations both present and future. The North American interconnected power system is modeled as a set of regions that are connected by a network of transmission paths.

D.2 Integration Methodology

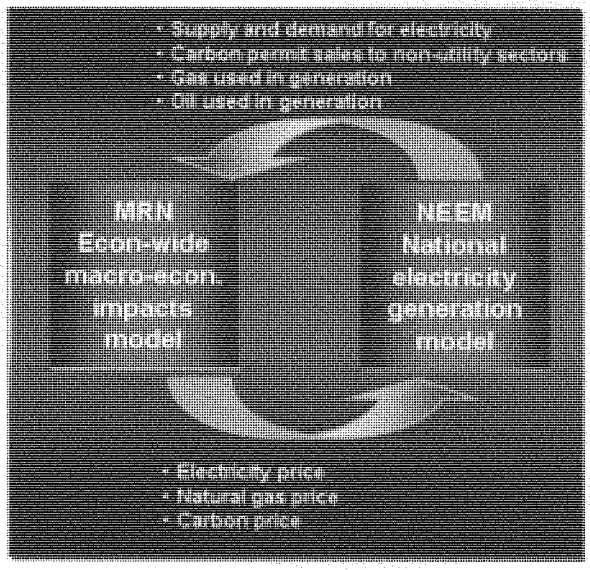
Linking MS-MRT and MRN-NEEM

There is a one-way link between the MS-MRT and MRN-NEEM models. The change in international prices from the U.S. adopting ACESA becomes an input to MRN-NEEM. This model represents the U.S. and assumes perfectly elastic supply and demand curves for imports and exports. The prices for these curves are determined by MS-MRT.

Linking MRN and NEEM

The MRN-NEEM integration methodology links the top-down and bottom-up models. The linking method utilizes an iterative process where the MRN and NEEM models are solved in succession, reconciling the equilibrium prices and quantities between the two. The solution procedure, in general, involves an iterative solution of the top-down general equilibrium model given the net supplies from the bottom-up energy sector sub-model followed by the solution of the energy sector model based on a locally calibrated set of linear demand functions for the energy sector outputs. The two models are solved independently using different solution techniques but linked through iterative solution points (see Figure D.3).

Figure D.3: MRN-NEEM iterative process



A more complete documentation of the MRN-NEEM model is available on CRA's website.[27]

[27] http://www.crai.com/uploadedFiles/RELATING_MATERIALS/Publications/BC/Energy_and_Environment/files/MRN-NEEM%20Integrated%20Model%20for%20Analysis%20of%20US%20Greenhouse%20Gas%20Policies.pdf.

APPENDIX E: ESTIMATION OF GREEN JOBS IN MRN-NEEM RESULTS

This appendix summarizes the methods CRA has developed to estimate the number of "green jobs" implicit in the MRN-NEEM results. These estimates of green jobs are preliminary and subject to further review and refinement, as they were very recently developed as an analytical component of CRA's modeling capability. All of our estimates of green jobs created are still consistent with the estimated net job losses that we have reported for the economy as a whole.

Estimating Employment Impacts of ACESA 2009 on the Renewable Electricity Industry

The imposition of a binding cap on GHG emissions incentivizes the deployment of renewable electricity sources such as wind and solar power, leading to an increase in employment in the sectors associated with the construction and operation of those technologies. Our analysis relies upon publicly-available data to estimate the number of direct jobs that would be created from the expanded use of renewable sources for generating electricity. Our methodology estimates new jobs associated with the manufacturing, construction, installation, and operation of five different technologies: wind, photovoltaic, solar thermal, biomass, and geothermal. Using CRA's MRN-NEEM modeling system to forecast new capacity additions along with public estimates of the relationship between new capacity and employment, we are able to estimate the number of full-time employment (FTE) years created as a result of ACESA 2009 in the renewable energy industry.[28,29] We also compared our results to those produced by the Department of Energy's Job and Economic Development Impact (JEDI) models for wind and solar and obtained similar results.[30]

It should be noted that there are limitations to estimating such employment impacts. The number of jobs associated with building and operating any industrial facility will vary by project, so applying a uniform assumption to all new projects represents a "best-guess" of the impacts.

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[28] "The Work That Goes Into Renewable Energy," Renewable Energy Policy Project (2001), Virinder Singh and Jeffrey Fehrs, Washington, D.C.

[29] Daniel M. Kammen, Kamal Kapadia, and Matthias Fripp (2004) *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* RAEL Report, University of California, Berkeley.

[30] See http://www.nrel.gov/analysis/jedi/.

Estimating Employment Impacts of ACESA 2009 on the Biofuels Industry

Using MRN-NEEM results, we are able to estimate the number of jobs created as a result of ACESA 2009 in the biofuels industry. The model is capable of estimating the amount of biofuels – including corn ethanol and cellulosic ethanol – demanded annually in the U.S. in the future. We then use publicly-available sources to estimate the number of employees needed to operate a 40-million-gallon per year ethanol plant operating at 95% capacity and extrapolate to estimate overall employment impacts on a national level.[31]

The ACESA scenario predicts the same amount of biofuels being consumed in a business-as-usual scenario as in a policy scenario with a binding carbon cap. This is not surprising given the ambitious biofuels production mandate set forth Energy Independence and Security Act of 2007 (EISA 2007) and the duplicative nature of adding a carbon policy on top of pre-existing standards. EISA 2007 mandates the production of 36 billion gallons of corn and cellulosic ethanol by 2022.[32] The model results show that these mandates – even though the EIA estimates that they will not be met[33] – drive the amount of biofuels consumed and, therefore, employment levels in the industry. As a result, we have projected no change in biofuels employment as a direct result of ACESA.

Estimating Employment Impacts of ACESA 2009 on the Automobile Industry

We used an approach similar to the biofuels methodology to estimate the employment impacts of ACESA 2009 on the "green" automobile industry. We considered vehicles that run on biofuels to be included in this "green" classification. However, because very few vehicles currently run solely on biofuels, we estimated the number of "biofuel car equivalents" that would be needed to consume the biofuels produced in MRN-NEEM. To do this, we used public data to determine the average annual vehicle miles traveled (VMT) per vehicle in the U.S. and assumed that this would remain constant over time.[34] Then, by using MRN-NEEM to estimate total U.S. VMT in each year, along with modeled biofuels production estimates, we are able to estimate the number of "biofuel car equivalents" sold in a given year. This information, combined with an estimate of the average productivity of a U.S. automotive worker,[35] leads to an estimate of the number of jobs created in the "green" automobile sector.

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[31] "Economic Impacts of Ethanol Production," Ethanol Across America (2006), Washington, D.C.

[32] The biofuels in the baseline are calibrated to the levels in AEO 2009 Early Release.

[33] *Annual Energy Outlook 2009, Early Release with Projections to 2030*, prepared by the U.S. Department of Energy, Energy Information Administration, January 2009.

[34] *Annual Energy Outlook 2009, Early Release with Projections to 2030*, prepared by the U.S. Department of Energy, Energy Information Administration, January 2009.

[35] "Wages and Employment of Workers in Automobile Manufacturing," U.S. Bureau of Labor Statistics, Jeffrey Holt, 2005, Washington, D.C.

Since the use of biofuels, and therefore the production of biofuel and hybrid vehicles, is driven by the production mandates in EISA 2007, we again find that the impact of ACESA on employment in the "green" automobile industry will be small relative to a business-as-usual, no-policy scenario.

Estimating Employment Impacts of ACESA 2009 from Energy Efficiency

The vast majority of the green jobs that we have estimated in our ACESA scenario are associated with increased energy efficiency-related spending. As the carbon costs force energy cuts in production, firms will react by including more non-energy inputs, which are relatively cheaper. The general equilibrium effects show that output decreases as the cost of production rises and income drops, suggesting lower employment as the end result of the policy. If we assume that output remains at the same (baseline) level, we can determine how many more jobs would be needed to work with less energy in producing the same level of output given the relative changes in prices of energy and non-energy inputs.

It should be noted that the jobs created in relation to the energy efficiency in this study refer to the increase in employment when less energy is used to produce the same level of output. We do not distinguish between the increases in employment due to the energy-efficient technical/behavior changes from the increases due to the substitution of energy with more employment of labor from a pure cost perspective.

Results

CRA has made preliminary estimates of the number of average jobs directly associated with the increased payments to labor for increased renewable electricity, more efficient automobiles, biofuels, and energy efficiency improvements in its model scenario of ACESA. The preliminary estimate ranges from 1 million in 2015 to almost 2 million by 2030. The creation of a green job does not always mean the creation of a "new" job. For example, moving an autoworker from producing a vehicle powered by conventional fuels to a vehicle powered by a hybrid engine would not constitute a "new" job. Instead, it is a job transfer to what one might call a green job. Our estimate of green job creation includes green jobs that are both "new," which are incremental to a business as usual scenario, and "transfers," which are jobs shifted from part of an industry negatively impacted by a policy to another part of the industry that is positively impacted by the policy. Our net job loss estimates above are derived from the same model run that simultaneously contains this large number of implicit employment in "green jobs."

Mr. MARKEY. Thank you, Mr. Montgomery, very much.

Our next witness is Nat Keohane, an economist and director of economic policy and analysis for the Environmental Defense Fund Climate and Air Program. We welcome you, sir.

STATEMENT OF NAT KEOHANE

Mr. KEOHANE. Thank you, Mr. Chairman and distinguished members of the subcommittee for holding this hearing. I am honored to be here today. I will add, I am also an economist by profession and training and have worked on cap-and-trade markets, although I can't claim to have the 40 years behind me that—when Dr. Montgomery was writing his thesis, I was yet to be born, so that is an interesting contrast.

So with the——

Mr. MARKEY. I am with you, Mr. Montgomery.

Mr. KEOHANE. With the proposed legislation that is the subject of this hearing, Congress has an unprecedented opportunity to put the American economy on a stronger footing for the 21st century. A cap on carbon will harness the efforts of entrepreneurs and innovators throughout our economy, ensuring that America will lead the world in making the next generation of clean energy technologies, and the investment unleashed by a carbon cap will help jump-start our economy today while paying rich dividends later in the form of cleaner air, enhanced energy security and most of all, a livable planet to pass on to our children and grandchildren.

In the process, a carbon cap will transform a common resource into a valuable asset. That asset is a public trust and allocating its value wisely and equitably is a crucial test of any climate bill. So what are the principles any set of allocations should reflect? First, a substantial portion of the allowance value should go to energy consumers, particularly low-income households. Second, the allocations should preserve and strengthen international competitiveness of American businesses and workers during the transition to a clean energy economy. Third, the allocation must be fair and equitable, respecting differences across States and regions. Fourth, the integrity and credibility of the program must be preserved. Allowances that are intended for the benefit of consumers must be accompanied by strong safeguards to ensure that consumers receive the value, and while some allowances may fairly be allocated to industries in order to smooth the transition to a clean energy economy, Congress must avoid giving windfall profits to industry. Finally, the allocations should use some value to help advance the underlying objectives of the legislation such as investment in clean energy and for adaptation. These principles are consistent with the blueprint for legislative action that the business and industry coalition, U.S. CAP, has put forward, and the bill performs well on each of them.

First, energy consumers will receive ample protection against increases in cost. For the first part of the program, 40 percent of the allowance value will directly benefit energy consumers, households, small business and industrial users. In addition, a full 15 percent of the allowance value will be given to low- and moderate-income households. The Center for Budget and Policy Priorities estimates that this amount is sufficient to fully compensate those low-income

households for higher energy costs. Finally, nearly 20 percent of the value of allowances over the whole period will be returned to all households in the form of tax rebates. When you add it all up, about 44 percent, nearly half of the total allowance value, goes directly to households in the form of tax rebates or lower utility bills. That amounts to an estimated $700 billion in present value using EPA's projected allowance prices. So that is the first principle.

What about the second? Well, the Inslee-Doyle provision directs up to 15 percent of allowances in the early years to energy-intensive trade-exposed industries, and EPA estimates that this provision will fully compensate those industries for their increased costs. Third, the bill strikes an equitable balance across regions. This is done, as we have heard, by allocating half of the allowances for the electricity sector on the basis of carbon dioxide emissions and half on the basis of electricity generation. But more broadly, regional equity is ensured by the use of multiple channels, for example, combining direct tax rebates for households with reductions in utility bills. Fourth, the legislation ensures that allowance value intended for consumers will reach them. Allowances will be allocated to local distribution companies with clear and stringent provisions requiring those LDCs to demonstrate how they will pass on the value to consumers before they can receive a single allowance. Finally, over one-quarter of the allowance value over the life of the bill will fund public purposes to help achieve the broader environmental objectives. These include funding for clean energy innovation, for carbon capture and sequestration, for investments in renewable energy and energy efficiency, and adaptation.

In sum, this legislation satisfies the five principles I laid out and does so with flying colors, but in a sense, the true test of the allocation scheme boils down to just one number: the estimated cost to American households. The best estimate we have is from a recent analysis by the Environmental Protection Agency of the bill. You will hear groups on both sides including the prior witness come up with other numbers but the EPA relied on the gold standard, two of the best and the most widely respected peer-reviewed economic models available, and what they found—and by the way, they only looked at the costs to households. They did not look at the benefits in the form of enhanced energy security and cleaner air and averting catastrophic consequences of climate change, only looking at the costs. The EPA estimated the average cost of the average household at just $98 to $140 per year in present value. One way to think of it, that is 27 to 38 cents a day for the average American family, or less than a postage stamp. It is also, and I have done this before but I will do it again to make it concrete, it is about 13 cents per person per day, a little more than a dime a day. A big part of the reason these estimated costs are so low is because they take into account that much of the value of allowances will go back to households, and while the EPA specifically analyzed the discussion draft, it has reported that the estimated household costs are likely to be even lower once all the provisions of the current legislation are taken into account.

Mr. Chairman, environmental organizations like mine are quick to criticize Congress when public policy diverges from what we see as the public interest. In this case, however, this committee got it

right. The proposed allocations will keep costs low for consumers, ensure a level playing field for American industry and promote investment in a clean energy future, all while preserving the environmental and economic effectiveness of this legislation.

Thank you for inviting me to testify. I look forward to your questions.

[The prepared statement of Mr. Keohane follows:]

Oral Testimony

Nathaniel O. Keohane, Ph.D.
Director of Economic Policy and Analysis
Environmental Defense Fund
Before the
Subcommittee on Energy & Environment,
Committee on Energy & Commerce,
United States House of Representatives

June 9, 2009

Thank you, Chairman Markey and distinguished members of the Subcommittee, for holding this hearing. I am honored to be here today.

Congress has an unprecedented opportunity to put the American economy on a stronger footing for the twenty-first century. A cap on carbon will harness the efforts of entrepreneurs and innovators throughout our economy — ensuring that America will lead the world in making the next generation of clean-energy technologies. And the investment unleashed by a carbon cap will help jump-start our economy today, while paying rich dividends later — in the form of

cleaner air, enhanced energy security, and most of all a livable planet to pass on to our children and grandchildren.

In the process, a carbon cap will transform the public commons into a valuable asset. That asset is a public trust, and allocating its value wisely and equitably is a crucial test of any climate bill.

What are the principles any set of allocations should reflect?

First, a substantial portion of the allowance value should go to energy consumers — particularly low-income households.

Second, the allocation should preserve and strengthen the international competitiveness of American businesses and workers during the transition to a clean energy economy.

Third, the allocation must be fair and equitable, respecting differences across states and regions.

Fourth, the integrity and credibility of the program must be preserved. Allowances that are intended for the benefit of consumers must be accompanied by strong safeguards to ensure that consumers receive the value. And while some allowances may fairly be allocated to industries in order to smooth the transition to a clean-energy economy, Congress must avoid giving windfall profits to industry.

And finally, the allocation should use some value to help advance the objectives of the legislation.

These principles are consistent with the Blueprint for Legislative Action that the business and industry coalition, USCAP, has put forward. And the bill performs well on each of them.

First, energy consumers will receive ample protection against increases in cost. For the years 2012-2025, 40% of the allowance value will benefit energy consumers — households, small businesses, and industrial users.

In addition, a full 15% of allowance value will be given to low- and moderate-income households. The Center for Budget and Policy Priorities has estimated that this amount is sufficient to fully compensate those households for higher energy costs.

Finally, nearly 20% of the value of allowances over the whole period will be returned to all households in the form of tax rebates.

When you add it all up, about 44% of the total allowance value would go directly to households in the form of tax rebates or lower utility bills. That amounts to an estimated $700 billion in present value, using EPA's projected allowance prices.

Second, the Inslee-Doyle provision directs about 12% of total allowance value in the years 2012-2026 to energy-intensive trade-exposed industries. EPA estimates that this provision will fully compensate those industries for their increased costs in the initial years of the program.

Third, the bill strikes an equitable balance among regions. This is done by allocating half of the allowances for electricity consumers on the basis of carbon dioxide emissions and half on the basis of electricity generation. More broadly, regional equity is ensured by the use of multiple channels — for example, combining direct tax rebates for households with reductions in utility bills.

Fourth, the legislation ensures that allowance value intended for consumers will reach them. Allowances will be allocated to local distribution companies, with clear and stringent provisions requiring the LDCs to demonstrate how they will pass the value on to consumers before they can receive a single allowance.

Finally, 26% of the allowance value over the life of the bill will fund public purposes to help achieve the broader environmental objectives. These include funding for clean energy innovation, carbon capture and sequestration, investments in renewable energy and energy efficiency, and adaptation.

It's easy to get lost in all the percentages. But in a sense the true test of the allocation scheme boils down to just one number: the estimated cost to American households.

EPA recently analyzed the Waxman-Markey bill using two of the most highly respected, peer-reviewed economic models available. They looked only at the costs of reducing emissions, and ignored the benefits from averting the catastrophic consequences of unchecked climate change, not to mention cleaner air and greater energy security.

Even just looking at the cost side of the ledger, that analysis projected that over the entire life of the bill, the annual cost to the average household will be just $98 to $140 (in present value). That is just 27 to 38 cents a day for the average American family — less than the cost of a postage stamp. To put it another way, it's around 11 to 15 cents per person — a little more than a dime a day.

A big part of the reason these estimated costs are so low is because they take into account that the value of allowances will go back to households. And while the EPA specifically analyzed the discussion draft, it has reported that the estimated household costs are likely to be even lower once all the provisions of the current legislation are taken into account.

Environmental organizations like mine are quick to criticize Congress when public policy diverges from the public interest. In this case, however, Congress got it right. The proposed allocations will keep costs low for consumers, ensure a level playing field for American industry, and promote investment in a clean energy future — all while preserving the environmental and economic effectiveness of this legislation.

Thank you for inviting me to testify. I look forward to your questions.

Mr. MARKEY. We thank you very much.

Our final witness is the Reverend Dr. Mari Castellanos, and she is a minister for public advocacy with the Justice and Peace Ministries of the United Church of Christ. We welcome you.

STATEMENT OF MARI CASTELLANOS

Reverend CASTELLANOS. Good morning, Chairman Markey, Ranking Member Upton, Ranking Member Barton and other members of the committee, thank you very much. Thank you for the invitation to testify today. It is a pleasure to be here, and I am honored to be here this morning representing the National Council of Churches.

The church is going to address the issue of climate change to remain faithful to our teachings about justice and stewardship. The Bibles teaches us to love our neighbors as ourselves, to protect and provide for those living in poverty and to tend for God's creation in a manner that recognize the beauty and the bounty that the Lord has blessed us with. Climate change is a moral issue and a reflection of our failure to live out God's call. Diverse faith traditions including Catholics, Protestants and Jews have recognized the importance and necessity of reducing our greenhouse gas emissions to a level that will prevent the worst impacts of climate change.

A recent report by the Global Humanitarian Forum paints a bleak picture of the impact that climate change is having and will continue to have on God's creation and God's people. The findings indicate that every year climate change leaves over 300,000 people dead, 325 million seriously affected and creates economic losses of $125 billion. These are astonishing numbers but they provide the quick realization that climate change is not any longer something that may happen but rather it is already happening, and we must act decisively to prevent the worst impacts while protecting the most vulnerable.

Rosemary Miega is one individual whose story comes to mind. A middle-aged Ugandan woman after retiring from government work, Rosemary started her own farming cooperative. After 5 successful years of Rosemary working with local farmers in her region, helping them increase their profits, the rain patterns in Uganda began to shift. What had been a flourishing, self-sufficient farming community became impoverished almost overnight. Churches and nongovernmental organizations around the world are working to help communities adapt to changes in their local environment but it is not enough. Estimates indicate that $86 billion per year will be needed to help developing countries adapt to climate change. As the world's largest historical emitter of greenhouse gases, it is morally imperative for us to provide a response that is adequate to their needs and proportional to our share of the emissions.

This is why ample international adaptation assistance must be included in any climate legislation the United States puts in place. At a bare minimum, the United States should provide $7 billion a year to the most vulnerable developing nations, those who are suffering and will suffer from the impacts of climate change we can no longer reverse. This is an issue of justice and moral responsibility. It is also an issue of global security and stability. Our will-

ingness to adequately assist our global neighbors in their time of need will be a direct reflection of our ability to accept responsibility for our past actions and will play a critical role in the development of a successful global agreement that addresses climate change.

As the United Nations currently negotiates the post-Kyoto treaty, it is vital for the United States to commit to a more equitable response. For the United States to be seen as a good global neighbor, we must provide financial assistance to developing countries through both bilateral and multilateral agreements. For too long we have dragged our feet. If we are to be taken seriously, we must bring something substantial to the table. The inclusion of responsible international adaptation assistance will help to maintain both economic stability and global security. We truly live in a global village and depend on all our neighbors for our prosperity. International adaptation assistance will ensure the economic and political stability of developing nations. The committee's inclusion of equitable international adaptation assistance in the American Clean Energy and Security Act would be a compassionate, just and appropriate step forward to meet the severe needs of those who are already suffering and at risk.

Mr. MARKEY. If you could summarize, please?

Reverend CASTELLANOS. While we are thankful to the committee for its support of this critical component, we do fear that the amount of money available to this program is insufficient to meet the present and growing needs of the communities around the world.

Thank you very much, and may God bless your endeavors.

[The prepared statement of Reverend Castellanos follows:]

Testimony of Rev. Dr. Mari Castellanos
Minister for Policy Advocacy
United Church of Christ, Justice and Witness Ministries

June 9, 2009

Good morning Chairman Markey, Ranking member Upton and members of the Committee. Thank you for the invitation to testify today. It is a pleasure to be here. I am Rev. Dr. Mari Castellanos, Minister for Policy Advocacy for the United Church of Christ. I am here today representing the National Council of Churches.

The church is called to address the issue of climate change in order to remain faithful to our teachings about justice and stewardship. Throughout the Bible, we are taught to love our neighbors as ourselves, to protect and provide for those living in poverty and to tend to God's Creation in a manner that recognizes the beauty and the bounty that the Lord has blessed us with. Climate change is a moral issue and a reflection of our failure to live out God's call. Diverse faith traditions including Catholics, Protestants, and Jews have recognized the importance and necessity of reducing our greenhouse gas emissions to a level that will prevent the worst impacts of climate change.

A recent report by the Global Humanitarian Forum paints a bleak picture of the impact that climate change is having and will continue to have on God's creation and God's people. The findings indicate that every year climate change leaves over 300,000 people dead, 325 million people seriously affected, and creates economic losses of US$125 billion. In addition, 4 billion people are vulnerable, and 500 million people are at extreme risk. These are astonishing numbers but they provide the quick realization that climate change is no longer something that may happen, but rather it is already happening and we must act decisively to prevent the worst impacts while protecting the most vulnerable.

I have had heartrending occasions to listen to victim's accounts of the impacts of climate change around the world; as well as the privilege to see how churches and communities are responding to the needs of our global neighbors. Rosemary Mayiga is one individual whose story comes to mind. A middle aged Ugandan woman, after retiring from government work, Rosemary started her own farming cooperative. After 5 successful years of Rosemary working with local farmers in her region, helping them increase their profit, the rain patterns in Uganda began to shift. What had been a flourishing, self sufficient farming community became impoverished almost overnight.

Churches and non-governmental organizations around the world are working to help communities adapt to changes in their local environment, but it is not enough. Estimates indicate that $86 billion per year will be needed to help developing countries adapt to climate change. As the world's largest historical emitter of greenhouse gases, it is morally imperative for the US to provide a response that is adequate to their needs and proportional to our contribution to this global crisis. We must provide sufficient assistance to help these countries and communities adapt. This is why ample international adaptation assistance must be included in any climate legislation the US puts in place.

At a bare minimum, the US should provide $7 billion a year to the most vulnerable developing nations to help those who are suffering and will suffer from the impacts of climate change we can no longer reverse. This is an issue of justice and our moral responsibility. It is also an issue of global security and stability.

Our willingness to adequately assist our global neighbors in their time of need will be a direct reflection of our ability to accept responsibility for our past actions and will play a critical role in the development of a successful global agreement that addresses climate change.

As the United Nations currently negotiates the post Kyoto treaty, it is vital for the US to recognize those who are already suffering, and to commit to a more equitable response in the future. Your inclusion of international adaptation assistance shows the US interest in engaging with other nations while contributing to the global effort to alleviate the devastating effects of the climate crisis. For the US to be seen as a good global neighbor, we must provide financial assistance to developing countries through both bilateral and multilateral agreements. For too long we have dragged our feet. If we are to be taken seriously, we must bring something substantial to the table.

The inclusion of responsible international adaptation assistance will help to maintain both economic stability and global security. We truly live in a global village and depend on all of our neighbors for our continued prosperity. International adaptation assistance will help ensure the economic and political stability of developing nations.

This committee's inclusion of equitable international adaptation assistance in the American Clean Energy and Security Act is a compassionate, just and appropriate step forward to meet the severe needs of those who are already suffering and at risk.

While we are thankful for your support of this critical component, we do fear that the amount of money available to this program is insufficient to meet the present and growing needs of communities around the world. To adequately meet our responsibility the initial allocation of 1% to this fund must be substantially increased now and quickly augmented over time to reflect the growing global need for adaptation assistance.

The churches that make up the National Council of Churches wish to express our appreciation and gratitude for your willingness to work hard to address climate change in a just and equitable manner and we look forward to working with as you move forward in this process.

Thank you very much. May God bless your endeavors.

Mr. MARKEY. Thank you so much. Our committee needs God's blessing in terms of this legislation. Thank you.

The Chair will recognize himself for a round of questions, and I will first note that in December of 2008 the price of a barrel of oil had gone down to $30 a barrel. It is now up to $69 a barrel. The price of gasoline at the pump, the national average was $1.61 in December. It is now up to $2.62, so it has gone up 80 cents, and this is as we are in the middle of the worst recession since World War II, so we can only assume that we are in the eye of the storm. We are heading back towards $4-a-gallon gasoline. We are heading back towards $147 a barrel for oil. So we need a plan and we can't run the risk of just living on this roller coaster. Our economy just rises and falls with the price of oil and is held hostage by OPEC. So we need a plan and we need something that works.

Your company, Mr. Farrell, generates power using a similar formula to Mr. Sokol's company. We have a formula in the legislation that follows the recommendation of the Edison Electric Institute that allocates 50 percent of electric power's allowances based on emissions and 50 percent based on retail electricity sales. Can you explain why you believe that formula, why EEI believes that formula is fair and what would happen in terms of EEI's support if we altered that formula?

Mr. FARRELL. Mr. Chairman, thank you for the question. The background for the formula is important I think to understand how it got to where it is. EEI has member companies from all across the country, represents all the regions, all different kinds of customers, has all different kinds of generation mix, some very heavy coal, some very heavy nuclear, some mixed like ours is, like some of Mid American's assets, and as we sat through a 2-year process to come up with a program that could allocate out the allowances, we came to a conclusion, the compromise that made sure that there was the most consumer protection across the Nation was to come up with this formula where half of the allowances came related to your sales and half of it came related to the way in which your power is generated, and that includes purchase power for utilities that don't own all of their generation, a very important component. But the key is not so much the allocation methodology, the breakdown between 50 percent sales and 50 percent how your generation comes. It is the length of the timetables and the rapidity with which you have to meet the caps. So the longer the timetable, the more consumer protection and the lower the cap is or the higher the emissions allowed are over the period of time, the greater the consumer protections, and that is why our focus was on trying to get to 2025 before there was a phase-out. We were hopeful that the phase-out would be longer and we hoped that there would be improvements.

But no one is requiring a utility—the mandate in the bill, as I understand it, is the cap, is a reduction of greenhouse gas emissions over a period of time. You are not required to take allowances. If you choose to change out your fleet over that period of time, you are free to do that so there wouldn't be any costs associated with allowances over that period of time as may have been suggested. So the key is, we were trying to come up with a methodology that would spread out the consumer protections across as

many consumers as possible and to take into account the various generation mixes that exist in the United States. That is how we came up with the formula.

Mr. MARKEY. Mr. Keohane, could you reflect on Mr. Montgomery's testimony? Tell me about past studies that have been conducted by his organization and generally how have past industry cost estimates compared to actual costs of programs under the Clean Air Act.

Mr. KEOHANE. Thank you, Mr. Chairman. Yes, I think it is important to note a few things, and by noting these, I am just looking at the numbers. I don't mean to cast any aspersions on the intents or what Dr. Montgomery and his colleagues may have tried to do. But it is a fact that if you look, if you go back and look, every time there has been a climate change bill, there is a range of cost estimates and CRA is always on the high end of those cost estimates. Even more tellingly, we went back actually and we looked at a range of estimates that CRA had made of prior environment regulation, and again, in that case, every time CRA was on the high side, usually at the very high side, of those estimates of environmental regulation, sometimes several times, three to four or more times the costs that were estimated by EPA and independent government agencies, and when you go back and you compare those to the actual costs, CRA consistently was much, much higher than the actual costs. This is, by the way, a general trend and it is useful to mention because several researchers including some at Resources for the Future have gone back and compared actual costs of environmental regulation to predicted costs that were done at the time it was passed, and in an overwhelming majority of the cases, particularly for market-based regulation, the estimates that were made at the time of legislation, even by government agencies like EPA, turned out to be much higher than the actual costs. I will give one estimate. We have heard about the SO_2 allowance program. That turned out to be less than 30 percent of the cost that was estimated by EPA on the eve the legislation was passed. So I think if we take that pattern, what we learn from the past record is that estimates and particularly by CRA but frankly by everybody have turned out to be overestimates of the cost of environment regulation, and the reason is, they can't take into account technological innovation. Thank you.

Mr. MARKEY. Thank you, Mr. Keohane.

I am going to have to recognize—my time is expired. I am sure that there are members who are going to give you plenty of time——

Mr. BARTON. Mr. Chairman, I think since he made a direct comment against Mr. Montgomery, Mr. Montgomery ought to have a right to respond to what he just said.

Mr. MARKEY. Well——

Mr. BARTON. I ask unanimous consent that the chairman has an additional 2 minutes so that Mr. Montgomery can respond.

Mr. MARKEY. If the gentleman would like to yield me 2 additional minutes, that would be great. I am not requesting it.

Mr. BARTON. You can object to it, Mr. Chairman.

Mr. MARKEY. No, not at all. Mr. Montgomery.

Mr. MONTGOMERY. Thank you, Mr. Chairman. I appreciate your indulgence. But Mr. Keohane's statements about the comparison between CRA's estimates and analysis of the costs of climate legislation are simply not true. I am sure that we have been on different ends of the range of estimates at various points in time, and I am not sure I can even figure out what it was that he is referring to in our analysis of other environmental regulations.

But let me point out what actually happened last year. This disturbs me because this calumny against CRA has been repeated over and over again, that we are consistently higher than everyone else, and we have actually responded to it for the record in the hearings that were held of the Lieberman-Warner bill, and I would like to submit again both the question and the answer for the record that we submitted when this came up in the Lieberman-Warner debate when my colleague Ann Smith was testifying. But the fact is that last year there were a number of studies that were done of the Lieberman-Warner bill. They differed a great deal. They differed mostly because people made different assumptions about what was in the bill. Many of the studies were looking at outdated versions of the bill. The Electric Power Research Institute, which is, I believe, an independent and objective research institution, part of the electric power industry, put on a forum in Washington where they brought all of the modelers who had actually produced analyses of the Lieberman-Warner bill, the Clean Air Task Force, the Energy Information Administration, the work that was sponsored by the National Association of Manufacturers, Massachusetts Institute of Technology with their EPO model, EPA and Charles River Associates. When you took the analyses that made similar assumptions and that characterized the bill in a similar way, we were dead in the center of those results. We have generally been dead in the center of any effort to look at our analysis that has compared comparable analyses that were looking at the same bills, the same carbon credits and the same characterization, for example, of how much offsets were available. So I object to the characterization that we have always been higher than anybody else in this analysis.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Michigan, Mr. Upton.

Mr. UPTON. Thank you, Mr. Chairman. I ask unanimous consent to put in a statement from Jim May, president and CEO of the Air Transfer Association of America, on allowance allocations, if I might.

Mr. MARKEY. Without objection, so ordered.

Mr. UPTON. I regret in my opening statement I referred to Mr. Sokol's testimony. I meant Mr. Cousins, so I apologize for that.

Mr. Cousins, how much money have you all invested in environmental improvement projects at your refinery, and can you describe some of those improvements that you have made?

Mr. COUSINS. Well, first, that is the first and only time in my life I am going to be mistaken for somebody as articulate and intelligent as Mr. Sokol, so I appreciate that.

We have spent somewhere upwards of $300 million over the last 30 years on environmental projects. I do not have the exact number because some of the data is——

Mr. UPTON. And do you have an estimate of what this bill for you to stay in business—you indicated in your testimony that you would be out of business in fairly short order, 1,200 jobs, but if you were able to stay in, what type of capital improvements would this bill require you to do in terms of cost?

Mr. COUSINS. Well, actually, in our business, since there is no way to reduce the carbon and hydrocarbon products, there really is no investment solution to fix this for us.

Mr. UPTON. You are just done?

Mr. COUSINS. Just buying the credits, which is $180 million a year and progressing on up to as high as $750 million or $2 billion a year, which are far beyond our annual profits of $13 million a year.

Mr. UPTON. Is your sense that what Jack Girard from the American Petroleum Institute said today that is quoted in the Washington Times, that allowances would mean an increase as much as 77 cents a gallon for gas and diesel going up 88 cents? Is that about right?

Mr. COUSINS. I have seen numbers that high. I have seen numbers as low as 20 cents a gallon and as high as the 80-cent range. It is very difficult to predict. The carbon number portion you can predict. The ramifications of shifting most of this Nation's energy supply into the hands of a very few giant multinational corporations out of the hands of a more diverse group of smaller companies is hard to predict.

Mr. UPTON. And Mr. Hodges, what would an 88-cent increase for a gallon of diesel do to the trucking industry?

Mr. HODGES. Well, it would take our number two cost and immediately push it to our number one cost. It would immediately start to drive trucking companies out of business, mostly those that are small and somewhat marginally capitalized.

Mr. UPTON. Mr. Sokol, you indicated in your remarks that you were figuring that it was going to cost $810 million at $25 a ton.

Mr. SOKOL. That is just for our regulated utility customers.

Mr. UPTON. Right, and I notice that, I guess it was Brookings that said Brookings estimates that the market could drive up the price of carbon dioxide allowance to as much as $50 a ton by 2020, so I would presume that that would double the cost.

Mr. SOKOL. We have seen estimates between $50 and $125 a ton.

Mr. UPTON. And how much would that mean for the average consumer? Is it really 13 cents?

Mr. SOKOL. No, and those numbers—you know, you can make numbers say whatever you want. If you like, I can go through an example in the State of Iowa where while I actually live in Nebraska, we actually—Nebraska is 100 percent public power State, which I point out public power associations and rural electric coops also oppose this bill for the same reasons we do, and the reason is, it throws the consumer under the bus. In Iowa, our cost increase just for 784,000 customers is $283 million in the first year just for the allocation purchases. That will be $110 per month per customer. They can't afford it.

Mr. UPTON. Mr. Wells, last question as my time is coming up. You indicated in your testimony that you would support a carbon agreement to prevent carbon leakage.

Mr. WELLS. What we are saying is for trade-exposed energy-intensive industries, we need the 15 percent allowance until such time that there is agreement, international agreement to level the playing field.

Mr. UPTON. So if for some reason the WTO rules that either the border adjustment or free allowances are in fact unfair and need to be taken out, is Dow Chemical going to still support this bill?

Mr. WELLS. If we don't have the free allowances——

Mr. UPTON. If those are taken out?

Mr. WELLS. Yes, if the free allowances aren't there, that would put us at a competitive disadvantage to other economies, particularly those economies that are more carbon intensive. That would be a problem for our industry and for our company.

Mr. UPTON. My time has expired. Thank you.

Mr. BOUCHER [presiding]. Thank you very much, Mr. Upton. The Chair will now recognize himself for a round of questions.

Mr. Farrell, as a fellow Virginian, let me take this moment of personal privilege to welcome you to the subcommittee today and thank you for your outstanding testimony. I want to propound several questions to you in order to demonstrate how a cap-and-trade program that operates based on free allocation can effectively reduce greenhouse gas emissions with the least cost to consumers. So let us begin with the obvious. Some have suggested that for the program to be effective, it has to be based on an auction, that only the auction can put a price on carbon dioxide emissions, that only under an auction scenario will the program actually be effective in reducing greenhouse gases. So let me ask you to explain how under free allocation with a cap-and-trade provision reductions actually occur.

Mr. FARRELL. Thank you, Mr. Chairman. There is a cap, as you say, and the cap limits the amount of carbon dioxide emissions that can actually occur. So the cap itself acts to reduce carbon emissions.

Mr. BOUCHER. And then that cap is lowered over time?

Mr. FARRELL. Lowers over time. As you get to 2050, you are at an 80 percent lower level than you are now, so that is how you get there with one respect. We didn't touch on this, but the bill has a very rigorous energy efficiency standard in it which is going to reduce carbon emissions independently from the cap-and-trade part of the bill. The allowance provisions, the free allowance provisions, particularly for electric utilities, allow us to keep costs of the transition of this economy away from more carbon-based sources of generation to less carbon-based to dampen, moderate the costs on the consumer. I think to—I don't want to get into a debate with another witness but to suggest that a free allowance system throws consumers under the bus is something I just cannot agree with——

Mr. BOUCHER. Well, I will get to that part of it in just a moment. So what I think we can conclude from this answer is that the effectiveness of the cap-and-trade program based on free allocation comes from the cap itself and the fact that that cap is lowered every year in accordance with the terms of the program and so the

emitting entities are allowed to emit less each year, and as they comply with that lowering cap, overall emissions are reduced. Is that a fair description of how it works and that works with free allocation?

Mr. FARRELL. Yes, Mr. Chairman.

Mr. BOUCHER. So I think the next obvious question is, how we make sure that the financial value of these freely allocated allowances inure solely to the benefit of the electricity consumers and could you address the provisions in the legislation that make sure that when these allowances are allocated to the local distribution companies, that the benefit, the financial benefit of that allowance inures to the ratepayer benefit?

Mr. FARRELL. Mr. Chairman, local distribution companies, that is the essence of the proposal, and what that means is, is that the local company that has the wires that distributes the electricity rather than the generator of the electricity, it is the company that distributes it will receive the allowance in this 50/50 breakout, 50 percent based on sales, 50 percent based on its generation sources. Local commissions, State commissions exist in all 50 States and have been regulating electric utilities for 100 years, have a lot of knowledge on how to protect ratepayers against profit taking by utilities or excess profits by utilities. So to the extent there is some dysfunction and there is some over-allocation of a particular allowance, the local utility commission is there to ensure that the benefit of it will go to the ratepayers and the bill has a particular provision in it, this bill, requiring it go to the benefit of the ratepayer.

Mr. BOUCHER. And the local distribution companies are regulated everywhere in the Nation?

Mr. FARRELL. All 50 States, and the District of Columbia.

Mr. BOUCHER. OK. Now, you have mentioned in your testimony a problem with the provisions in the bill that require a phase-out of free allocation and a phase-in of auctions, and that phase period begins in 2026 and goes through 2030, and I think you have recommended that that phase period be a longer period of time rather than simply 5 years. Can you talk about the importance of having a longer period as opposed to just that 5-year period?

Mr. FARRELL. Well, Mr. Chairman, the key consumer protection in this bill, as I said earlier, is not so much the 50/50, that is very important, but is the length of the time of the free allowances and the phase-in period as you move to auctions because we need time for the technology to catch up with the public policy, and the more time we have to get to the same endpoint, the 80 percent reductions by 2050, the more time we have to change out our technologies, which is going to cost consumers money, the longer we have the free allowances the better.

Mr. BOUCHER. One argument that I have heard for a longer period is that as the transition to auction occurs over a 5-year period, the electricity price increases that attend a movement from free allocation to auction would be relatively severe in each of those 5 years, that if you have a longer phase-in period, perhaps 15 years, the price shock of electricity price increases is therefore lessened, and from the vantage point of consumers, it would be better to have that longer period rather than the shorter period. Would you agree with that?

Mr. FARRELL. That is correct. We would agree with that.

Mr. BOUCHER. Now, let me address one final issue while I still have another couple of minutes remaining. I think it is important that everyone understand that there are two possible ways that electricity price increases could occur in association with a cap-and-trade program. One comes from the allocation process itself, and we have taken steps in our legislation, I think you would agree, to make sure that to the greatest possible extent we have cushioned the ratepayer from the rate increase effects that might come just from the allocation process. The second way in which electricity prices could increase is when utilities and other emitters have to take steps in order to meet the emission reduction requirements that come under the cap and the ratcheting down of that cap year by year, and I would like for you to address, if you would, the extent to which you think the provision in our legislation that would actually auction 15 percent of the total allowances and then have the revenue that the government receives from that auction be dedicated to cushioning the effect of the rate increase from that latter phenomenon, that is, the cost of actually reducing emissions for the middle and lower income electricity consumers across the country. Could you talk about the extent to which you think that can be effective?

Mr. FARRELL. Yes, Mr. Chairman. There will be, as the generation fleets are changed out over time, there will be increases in expenses in utilities to change to newer systems as Mr. Sokol referred to. It is an absolutely valid point, and we go over time, those will increase. The point of the 15 percent set aside is that that will be a revenue source and can be redistributed to help dampen the costs of what will necessarily increase electricity rates from the change-out of our generation fleets.

Mr. BOUCHER. All right. Thank you very much, Mr. Farrell.

My time is expired. The gentleman from Texas, the ranking Republican on the full committee, Mr. Barton, is recognized for 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman. I want to commend you for chairing this hearing in the absence of Mr. Markey and also commend you for actually paying attention. I think it is somewhat telling that on the majority side, you are the only one here, and this is pretty important, so hopefully you will take your knowledge and disseminate it on your side so that they will at least know what was said at this important hearing.

Mr. Sokol, when you made your remarks, you talked about some costs. My understanding is that you are taking those numbers strictly from your service territories that your company provides electricity for. Is that true?

Mr. SOKOL. That is correct, and I think it is very important to understand, those numbers that I gave you—and Congressman Boucher, we appreciate the efforts you have made to try and make this as fair as possible and I don't mean to—you have done everything I think you can, given the cards that are being dealt to you. But those numbers take into account everything you said, and I will tell you we have the concern that the consumer is being left under the bus here, not intentionally by you, I understand that, but all of these numbers that I went through for just the State of

Iowa, $283 million a year, is after all the allocations are passed 100 percent through to the customer, the 15 percent is reallocated to low income, it doesn't change the fact that purely compliance with the purchasing of the trading credits costs $283 million, which cumulates uninflated to $9 billion over 30 years for those consumers and that is on top of the $9.3 billion they are going to have to spend to build new generation plants to actually meet your caps because your point was an important one. We have to meet the caps, and we have not argued with the caps.

Mr. BARTON. Well, I need to reclaim my time, Mr. Sokol, because I have about four other questions. My question to the rest of the panel, does anybody dispute Mr. Sokol's numerical analysis? Anybody?

Mr. KEOHANE. I would just like to point out that I think Mr. Sokol speaks from a unique case——

Mr. BARTON. But do you——

Mr. KEOHANE [continuing]. Very long on coal-fired generation and——

Mr. BARTON. I am not asking where he—I am asking if you dispute his——

Mr. SOKOL. We are also the largest owner of renewables.

Mr. BARTON [continuing]. Numerical analysis.

Mr. KEOHANE. I think there is an issue——

Mr. BARTON. Is he telling the truth? I mean, he knows what the numbers are in his service territory. Do you dispute that he is lying to this committee? Do you assert that he is lying to this committee?

Mr. KEOHANE. I didn't say that, Mr. Barton. I said that he is an exception to a rule. I also want to point out, it is interesting to hear Mr. Terry talk about old coal-fired power plants when——

Mr. BARTON. Mr. Chairman, could I reclaim my time? I only have 2 minutes and 22 seconds. So we have established that one of the major power companies, at least in his service territory, there are huge cost increases in this bill that you can't paper away.

Now I want to go to Mr. Cousins. You are represented by Mr. Ross, I believe. I think he is in—your facility is in his district.

Mr. COUSINS. Yes, sir.

Mr. BARTON. If I understand you correctly, for refinery industry, you are saying that there are 2 percent allowances given to refineries generically but the products that the refinery industry in America creates are responsible for 35 percent of the emissions. Is that correct?

Mr. COUSINS. That is correct.

Mr. BARTON. And you are saying in the case of your refinery, you simply can't recoup the cost it is going to cost your refinery to stay in business. It is going to cost you $180 million a year and you don't believe you can pass that through. Is that correct?

Mr. COUSINS. We do not believe we can pass 100 percent of that through.

Mr. BARTON. So you are fairly certain if this bill becomes law or isn't changed in a material way for refineries, that your refinery that has been in business for 80 years is going to go out of business.

Mr. COUSINS. Yes, sir, and that is a serious thing to say, for us to say publicly. We would not say that if we were not——

Mr. BARTON. And that is 1,200 direct jobs and 3,600 indirect jobs.

Mr. COUSINS. That is correct.

Mr. BARTON. Now, would you care to speculate on how many of those job losses are going to get one of these new green jobs and at what level they are going to be compensated if they do get one of the new green jobs?

Mr. COUSINS. We don't have any of those jobs in our area right now, and I am not an economist or even—I wouldn't know how to speculate on that. I would not think that many of those are paying in the $25- to $30-an-hour range.

Mr. BARTON. Mr. Montgomery, the analysis of the bill for many of the proponents of the bill uses a per-ton estimate of about $10 a ton. In the bill itself in the strategic reserve, they have a minimum price for allowances sold for the strategic reserve of $38 a ton. Could you explain if you wish to the dichotomy between people that estimate the cost at $5 to $10 a ton and the fact that the strategic reserve minimum price is $38 a ton?

Mr. MONTGOMERY. I am not sure I can give a definitive answer to this, but my understanding is that the intention of this strategic reserve is to prevent prices to intervene much like the strategic petroleum reserve when prices spike to an unanticipatedly high level. I think that the estimate of $10 a ton presumably is those who assume that there is a very large—that all of the international offsets for forestry, from other sources, all the domestic offsets will be available at very low prices and that there is not much left to do after that to reduce emissions and that comes up with a price of $10 a ton. It suggests that price would have to increase by a factor of four before the strategic reserve accomplished anything which implies there is an awful lot of price volatility that would remain even if the strategic reserve were released when something really absolutely extraordinary happened.

Mr. BARTON. Mr. Chairman, my time has expired. I would like Mr. Keohane to submit for the record an answer to that same question since he is also an economist, or if you wish to give him a chance to testify right now, I would appreciate that.

Mr. BOUCHER. Thank you, Mr. Barton. Mr. Keohane, let me ask you in fact to do as Mr. Barton suggests and submit that for the record, and add to that answer, if you would, your response to Mr. Sokol's economic analysis. Look at it carefully, run your analysis against it and let us have the benefit of your view on that as well.

Mr. KEOHANE. I would be pleased to do both those things. Thank you.

Mr. BOUCHER. Thank you very much.

The gentleman from Kentucky, Mr. Whitfield, is recognized for 5 minutes.

Mr. WHITFIELD. Well, thank you, Mr. Chairman, and this testimony today has been quite interesting, and Mr. Sokol, now, you and Mr. Farrell, your companies both are members of the Edison Electric Institute. Is that correct?

Mr. SOKOL. Correct.

Mr. WHITFIELD. And the Edison Electric Institute, did they formally, Mr. Farrell, endorse this bill or did they not endorse the bill?

Mr. FARRELL. We are very supportive of the allocation formula and we are supportive of the bill going through the legislative process.

Mr. WHITFIELD. So you support the bill as is?

Mr. FARRELL. We are supportive of the bill going through the legislative process. We have asked for improvements which the chairman mentioned a couple, yes, sir.

Mr. WHITFIELD. So you are supporting it but you hope you can improve it as we go through the process?

Mr. FARRELL. Yes.

Mr. WHITFIELD. Now, I am assuming that the Edison Electric Institute Board voted upon this and the majority of them felt this way, correct?

Mr. FARRELL. It was unanimous of those attending the meeting.

Mr. WHITFIELD. OK.

Mr. SOKOL. We voted against it.

Mr. WHITFIELD. You voted against it?

Mr. SOKOL. Yes.

Mr. WHITFIELD. Oh, OK. So it was unanimous but someone voted against it. I won't get into that.

Mr. SOKOL. I know for sure we voted against it.

Mr. WHITFIELD. Well, Mr. Sokol, up here listening to you and Mr. Farrell testify, you both have retail electric, you both have natural gas customers, you both—both your companies operate in multiple States, 12 and 10 States, and you heard Mr. Farrell's testimony to Mr. Boucher's question, but would you explain to the committee why in your opinion your company and Mr. Farrell's company do not agree on this legislation?

Mr. SOKOL. Well, the Edison Electric Institute, of which we have been involved with the discussions for several years, first of all, it is an association so it deals with all kinds of different members, some of which have 100 percent nuclear, some have no generation at all, and so a normal and understandable debate would occur within an association that basically there were winners and losers, and it ultimately came from down from the association standpoint that this is the best they could get, and our view is, the consumer is not being represented in this debate, and I will give you an example and this is——

Mr. WHITFIELD. And could you try to also specify what the difference is you think between your company and Mr. Farrell's company?

Mr. SOKOL. There really is no difference between any of the companies in that the bill will act as it is written. Our difference is, and I think I can state it perhaps using a third company, a large company, AEP. They were recently challenged that this may cost their company $28.6 billion, a number they did not refute. Their comment was well, the report doesn't remember that we get to recover these costs through rate increases. That is the problem, is that utilities, particularly investor-owned utilities, and we own several, have made the decision that they are going to cut the best deal they can and then let the customer beware. But the customer is not in this room and that is what bothers us. Our ratepayers have to pay this. If you would add something that says have every public utility commission in every State in the next 30 days ana-

lyze this bill and tell the consumer what it will cost them and the consumers are happy with that, it is a pass-through for us. So but I am not going abdicate my responsibility to those consumers because people have to pay these bills and that is our difference with the Edison Electric Institute, and I think it is why EPPA and the rural electric co-ops are very concerned. They don't have shareholders. They just have consumers.

Mr. WHITFIELD. And I have heard from both of those groups quite emphatically, but Mr. Farrell, you sound like you are not worried about any increase for the consumer. I mean, are you concerned about that or do you feel that this bill actually protects them?

Mr. FARRELL. We are absolutely concerned about consumer protections, Mr. Whitfield, and I apologize to Mr. Sokol if I didn't hear his vote at the meeting. It was a very large majority of member companies——

Mr. SOKOL. That is true, by the way.

Mr. FARRELL [continuing]. Across the United States. And EEI's proposal is all about consumer protections. If the bill had called for 100 percent auctions, we would not—I certainly wouldn't be here responding favorably to Mr. Boucher's questions. Changing this to the free allowances for the length of time, we would like a longer period of time. We would like a less quick rise to the cap because we think that would increase the consumer protections but it is the essence of the free allowances through 2025, even though the cap is rising over that period of time, that provides the consumer protections in this bill. If they were not there, EEI would not be where it is today.

Mr. WHITFIELD. I might also say, Mr. Hodges, I am glad you are here testifying today. I read an article in the New York Times about six months ago comparing the trucking industry in the United States to China, and this article said we have in this country one of the most stringent emissions standards for diesel fuel emissions for trucks in the world, that China has one of the worst and it sounds like from your testimony with the possible increase of diesel fuel cost, it will even be less competitive with the Chinese transportation system.

Mr. HODGES. Well, fortunately, we don't haul to China.

Mr. WHITFIELD. But companies do.

Mr. HODGES. We are concerned with domestic transportation and everything that China does send to this country generally ends up getting delivered by a truck and that truck is powered by diesel fuel.

Mr. WHITFIELD. And the reason I am concerned about it is, when companies decide where to locate, they look at cost, and if transportation costs, labor costs, environmental costs are higher, then they may make decisions to go elsewhere. My time is expired.

Mr. BOUCHER. Thank you, Mr. Whitfield.

The gentleman from Oregon, Mr. Walden, is recognized for 5 minutes.

Mr. WALDEN. Thank you, Mr. Chairman.

Mr. Sokol, I want to go to this issue of equal allocation around the country because I have heard from some witnesses that this seems to be all fairly distributed and couldn't have been done bet-

ter and yet I understand from data I have received that Pacific Corps, your subsidiary company in Oregon, is only going to receive 53 percent of the allowances for free that it needs for compliance in 2012, which means ratepayers there will have to make up the difference of $163.5 million in one year. Meanwhile, our neighbors to the north under this legislation, Seattle City Light will get 29 times the number of allowances it needs for compliance for a windfall of $54 million in one year alone. Now, that doesn't sound like a very even distribution of allocation of these credits, does it, to you?

Mr. SOKOL. It doesn't, and I think it begs the question, if all these allocations are free, why are we doing it? You know, rarely have I seen a circumstance in my career where someone says all right, you have to buy these and then I am going to give them to you for free and so you are going to be neutral. Well, if it is that simple, why don't we just not do it? And that is really our point. Sometimes I think people can't take yes for an answer. Place the caps in place, the caps of 3 percent reduction, 17 percent growing to 83 percent by 2050. If that is policy, put them in place and mandate that every utility in the United States meet it. Those that already meet it have no cost and no harm. Those that don't meet it, and our utilities would not meet it, we would be required to go and change our equipment to do that, and that is a fair thing for us to do. This bill then adds again to that through this trading mechanism, and I guess the point just is, why have it? If the allocation is fair and is not going to cost anybody anything, then why are we doing it and why don't we just put the caps in place as we did with the Clean Air Act initially and ask our companies to meet it and we will do so or be shut down.

Mr. WALDEN. That is a thought I have often had, Mr. Sokol, that I don't get this. It looks to me like we should have learned our lesson from the subprime market. We had an amendment to prevent derivatives being pulled out of this and I think that was defeated during the markup. I am deeply concerned about the gaming of the system that lies ahead and the cost to ratepayers. Now, we focused a lot and rightfully so on household costs, and I have heard ranges from a postage stamp to, you know, $1,600. My concern, having been a small business owner for 21 years that ran transmitters in the radio business, we consumed a lot of electricity. Has anybody done analysis you are aware of or anybody on the panel on what this means to small businesses in America because I don't see them getting a rebate under this. They don't get a check from the government under this, do they? I mean, if I am a Pacific Corps customer and my business was, I have sold it, what do I get out of this bill other than a higher rate in Oregon?

Mr. SOKOL. Well, the way the allocations are done, the industrial customers would carry a larger piece of it, but——

Mr. WALDEN. Is a small business an industrial customer? You are just a shopkeeper. Is that how you are treated?

Mr. SOKOL. You know, barber shops, grocery stores, things of that nature would not fall underneath the low-income assistance side of the allocations.

Mr. WALDEN. So what happens to them?

Mr. SOKOL. They would pay more.

Mr. KEOHANE. Mr. Chairman, may I very quickly?

Mr. WALDEN. Actually I control the time but go ahead.

Mr. KEOHANE. I was just going to say, I think the commercial ratepayers are included in that local distribution company allocation so I think they would be addressed through the——

Mr. SOKOL. But that is——

Mr. WALDEN. Mr. Sokol, would you——

Mr. SOKOL. Those allocations are already in the numbers you used, 100 percent of them are given to the customers' benefit. The low-income allocations would not go to commercial——

Mr. WALDEN. Right, that is my point, and so it is a little misleading to say they are going to get that when these numbers include that, and so they don't get the extra help, and you know, I am in a district that is really facing Depression-era unemployment numbers. We are second to Michigan and Oregon in unemployment. My counties are at 17 to 20 percent unemployment. People are trying to figure out how to keep their doors open and this bill is going to absolutely put a new bill on their doorstep they can't afford, and I have been a small businessperson. I have signed the front of a payroll check and paid the bills, paid the light bills, the public utilities, the co-ops and even to you in the old days, Pacific Corps, and it matters and I am deeply concerned about where this is headed.

Now, I want to go off onto wind because my district has a lot of wind energy and I just want to get something on the record here, and I have been an advocate of renewable energy and wind energy, but I don't think it is the panacea some people think and it has a cost associated with it, and Mr. Sokol, it is my understanding that for every megawatt of wind, a power company has to have a backup or prudently should have some sort of backup energy source for when the wind doesn't blow. Is that true in your company, and if so, is there a ratio that you use?

Mr. SOKOL. If you are a load-serving utility, the answer to that is, you do need to have a backup until—and hopefully there is a lot of promise for battery storage technology currently emerging, and if that happens, that will help enormously, but without that, the wind only blows when it blows so——

Mr. WALDEN. So you have to have gas backup, right?

Mr. SOKOL. Gas or other generation.

Mr. WALDEN. Mr. Farrell, is that correct? You are nodding your head as well.

Mr. FARRELL. It is.

Mr. WALDEN. So aren't we in effect creating two energy systems here, one that works when the wind is blowing and one that works when it doesn't, and isn't there an added cost to that? And I am not against wind. We have a lot of it. It is a good thing, but to me, there are limits to what we can do and we need to know what those costs are.

Mr. SOKOL. I think in fairness, there is a cost to it but there is also environmental benefit that when the wind is blowing, we are not creating any emissions and so——

Mr. WALDEN. I agree with that.

Mr. SOKOL [continuing]. You know, there is a balance there, but there is a cost.

Mr. WALDEN. My time has expired, Mr. Chairman. Thank you.

Mr. BOUCHER. Thank you very much, Mr. Walden.

The gentleman from Louisiana, Mr. Scalise, is recognized for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. I will start with Mr. Wells.

In your earlier comments, you had talked about the carbon leakage. I think you had said will fail to protect American jobs if the allowances aren't allocated properly. You said the 2020 target is too high. There are excessive procedural hurdles and then you said if free allowances are not in the bill, Dow will be at a competitive disadvantage. Now, you are a supporter of this bill, right? This is coming from somebody who is a proponent.

Mr. WELLS. Yes, much like the previous comment. We are supportive of it to continue to move through the process but there are parts of the bill we would like——

Mr. SCALISE. So those are the highlights of the bill, is that jobs can be shipped overseas if it is not done properly. I want to ask you, especially as you talked about if the allocations aren't done properly you will be at a competitive disadvantage. Exactly what do you mean by that? Who will you be at a competitive disadvantage against?

Mr. WELLS. Let me use an example. Natural gas, I have talked about that every time I have been here, very, very critical to the American chemical industry. Natural gas prices have gone up 460 percent since 2000. In that time, American manufacturers have lost 3.7 million jobs. My own industry has lost close to a million jobs.

Mr. SCALISE. Because of the higher costs——

Mr. WELLS. The higher costs of energy——

Mr. SCALISE [continuing]. As it fluctuates.

Mr. WELLS [continuing]. And the higher costs of feedstocks associated with the rise in natural gas pricing. If free allowances are not there for what we call the energy-intensive trade-exposed manufacturers like petrochemicals, then it is safe to assume a similar sort of thing will occur.

Mr. SCALISE. Loss to where? Where would be——

Mr. WELLS. They would move places where energy costs are cheaper, so——

Mr. SCALISE. Do you have some examples of some of the countries?

Mr. WELLS. It would be the Middle East.

Mr. SCALISE. So our friends in the Middle East who were trying to—those of us who want to have a real comprehensive energy policy to encourage use of our natural resources to create good jobs here to reduce our dependence on Middle Eastern oil, in effect the Middle Eastern countries could actually benefit from a cap-and-trade energy tax if there is not adequate allocation to keep you competitive?

Mr. WELLS. Absolutely, yes.

Mr. SCALISE. Well, that is encouraging for some people, surely not people like me. What is the average pay of the jobs that your company has?

Mr. WELLS. They are well paying. I don't have a number. Our operators in the Gulf Coast, it has been many years since I worked down there but $70,000 and above is a good number.

Mr. SCALISE. Seventy thousand dollars a year on average. When you talk about jobs going to the Middle East, and obviously we have expressed concerns in this committee in other industries of jobs going to places like China, India, steel makers going to Brazil, in your industry, if a job that is producing products here in America goes to the Middle East where they are going to be producing the same product, they will just be producing it in another country, do you know how the carbon emissions compare? In other words, how much carbon your company emits producing something here in the United States versus how much they would produce in a country in the Middle East?

Mr. WELLS. I don't have exact numbers but, you know, in many cases our carbon footprint is a function of our energy efficiency and how well we use energy, and I have testified in front of this group that my particular company has cut our energy usage by 38 percent since 1990. We know that developing economies have not had that kind of improvement so it is safe to say that they are much more carbon intensive than we are.

Mr. SCALISE. Yes, which is another irony of this legislation, that purports to want to reduce carbon emissions when in effect by running more of these jobs overseas they are going to go to countries that emit more carbon, and carbon is a worldwide——

Mr. WELLS. If we don't take care of our energy-intensive trade-exposed——

Mr. SCALISE. So you could end up emitting even more carbon by legislation like this because those jobs go to other countries that emit more.

Mr. Cousins, you had talked about your refinery, the 1,200 jobs that would be lost, I think thousands more indirect jobs that would be lost. What is the average pay of your workers?

Mr. COUSINS. The pay is similar to the Gulf Coast. We might be 5 percent lower, so that number is—that $70,000 with overtime, we have got many employees in that range.

Mr. SCALISE. Seventy thousand dollars a year, jobs that would be lost. I know my time is running out. I don't know if you have seen the Spain study. Spain did a study on cap and trade in their country and how it affected them after years and years of going through that process. What they identified was for every quote, unquote, green job that they created, they lost 2.2 full-time jobs and in effect the green jobs they created, nine out of 10 of them were temporary jobs, so if you looked at it from a permanent job standpoint, for every one job they created, they lost 20 full-time jobs, and when you talk about the jobs that would be lost and you talked about India building a refinery basically to take the place when they shut down your 1,200 jobs at $70,000 a year. India will now be refining that oil that they will then be shipping here. How do their emissions compare to carbon that you emit?

Mr. COUSINS. It is going to be the same. It is going to go in the same atmosphere. It is going to be the same amount of carbon. It is going to be the same amount.

Mr. SCALISE. And if they don't follow the same regulations that are followed in America, if they actually emit more carbon——

Mr. COUSINS. Right, they won't have to——

Mr. SCALISE [continuing]. Producing the same oil that then we would have to be paying more for because then it would be coming from another country.

And Mr. Hodges, if I can, you had talked about the job losses. I think you said last year somewhere over 5,000 when the price of oil hit over $4 a gallon. Obviously because we don't have a strong policy, we became more dependent on Middle Eastern oil. For those of that want to reduce our dependence on Middle Eastern oil if we can lower that, we could, I guess, create more jobs but how many jobs would you lose if you actually had to pay more money because as President Obama said, prices would skyrocket under cap and trade. As his budget director, Peter Orszag said, families would have to pay higher utility costs and energy costs. Would you be able to absorb those costs or would you have to pass those on?

Mr. HODGES. Most of the time in our industry, we can pass a percentage of fuel increases to our customers, but unfortunately, we only get about 85 percent of that cost recouped from our customers, meaning we would have to absorb the 15 percent in addition to, as noted earlier, we would have additional high electricity costs. When we have a $40,000 spend a month for utilities, we are suddenly looking to going from $40,000 to $50,000.

Mr. SCALISE. So if you can't pass all of it on, then what happens?

Mr. BOUCHER. Mr. Scalise, I believe your time——

Mr. SCALISE. I apologize. So obviously the costs will be raised and you will lose jobs too, so I yield back. Thanks.

Mr. BOUCHER. Thank you, Mr. Scalise.

The gentleman from Florida, Mr. Stearns, is recognized for 5 minutes.

Mr. STEARNS. Thank you, Mr. Chairman.

At this hearing, the American Gas Association wanted to testify, unfortunately weren't able to. They would like to put their statement with unanimous consent as part of the record, Mr. Chairman.

[The information was unavailable at the time of printing.]

Mr. BOUCHER. Without objection.

Mr. STEARNS. I would like to ask each of you a question, and this is relative to India and China. Because once assuming let us say that somehow this gets through Congress and it is signed by the President, the question would be, would India, China, Russia and other countries unilaterally go ahead and implement a similar cap and trade. So the question I will have just for each one of you, just go down the panel here, do you believe that India and China would unilaterally adopt a cap and trade after we did it, yes or no, and then you might just give me a sentence if you say yes, why they would do it, and if you say no, why they wouldn't do it. I will start with you, the Reverend Castellanos.

Reverend CASTELLANOS. Well, you are asking a theologian to come up with an answer from an economist, but I would——

Mr. STEARNS. What better person to ask?

Reverend CASTELLANOS. I would say yes, if they really want to be faithful to the commitment to the nature and the environment.

Mr. STEARNS. I mean, do you think the history of China has shown that they will be faithful?

Mr. STEARNS. I believe in hope and I think that people change, and I see progress, and I think we could have a great influence on whether it goes that way.

Mr. STEARNS. OK. Next?

Mr. KEOHANE. I think sometimes the difference between theology and economics is not so great as people say. So at any rate, in answer to your question, I do think that the most important thing the United States can do to get countries like India and China——

Mr. STEARNS. Well, just yes or no. Do you think they will do it, first of all, yes or no?

Mr. KEOHANE. I do think they will follow——

Mr. STEARNS. So yes, they will unilaterally pass a cap and trade. OK.

Mr. KEOHANE. I think they will follow with a program to reduce and a commitment to reduce their own emissions within a reasonable period of time, and I know this, that if we don't do anything, they won't do anything, and that means that the climate crisis will continue.

Mr. STEARNS. Even though they are building a new coal plant every week, but anyway, go ahead, Mr. Montgomery.

Mr. MONTGOMERY. Unequivocally no.

Mr. STEARNS. OK.

Mr. MONTGOMERY. China—we would be giving away the only card remaining in our hand as we negotiate with the Chinese to convince them that they need to do something other than that we do not pay 100 percent of the bill for it. These are negotiations on national interest and we would be—and by committing ourselves to do something which they want us to do and getting nothing in exchange, we give away our only position.

Mr. STEARNS. And you are also saying that they have a competitive advantage by not adopting a cap and trade so they can stretch this out a couple years and say we will, we will but we won't and over 5 or 6 years they would get a competitive advantage.

Mr. Hodges?

Mr. HODGES. I would say also no, simply based on the fact that it has been my experience over years that issues like this only get addressed as economies mature. When they are in rapid growth, they don't address these issues. They address other issues that are pertinent to the growth, not issues that are pertinent to controlling the growth and refining that growth.

Mr. STEARNS. Mr. Cousins.

Mr. COUSINS. Based only my limited supply of common sense, I would say no.

Mr. STEARNS. OK. Mr. Sokol.

Mr. SOKOL. I think when it becomes in their economic and political interests to do it, they would and not until then.

Mr. STEARNS. So your answer is no, and so we are operating on a cap and trade and they would not adopt it, and they would—do you think they would ever adopt it?

Mr. SOKOL. Well, at some point, as I said, when it becomes in their economic and political interests, then they will but that point may be 20 years from now. And your question really drives to the

point that I think is extremely important is, if we are going to do this, and I think the sense is, we are going to put the caps, let us do it at the lowest cost to the consumer and to industry so that if we are wrong in our guess that they are going to follow us, we have at least done the least damage economically.

Mr. STEARNS. Right, so we are losing whole complete competitive advantage.

Mr. Wells.

Mr. WELLS. No, I don't think they are going to have cap and trade any time soon. However, I do think if we go ahead, they will do things to address their intensity. I am particularly very optimistic about their work on energy intensity and energy efficiency which in fact in many cases is better than what we are doing here.

Mr. STEARNS. Do you think India is developed enough that even if they could, they would? Do they have the regulatory powers and the type of political environment that they could adopt something like this?

Mr. WELLS. I would have to defer. I am not an expert on India. I do know quite a bit more about China but cannot answer for India. I apologize.

Mr. STEARNS. OK. And lastly, Mr. Farrell.

Mr. FARRELL. Congressman, I am here on behalf of EEI, and as far as I am aware, they don't have a position on that question.

Mr. STEARNS. How about you? Do you have a position?

Mr. FARRELL. I am not an expert enough in what goes on in China and India to offer you any useful information.

Mr. STEARNS. OK. So you defer not to answer. OK.

Mr. MARKEY. The gentleman's time has expired.

Mr. STEARNS. OK. Thank you, Mr. Chairman.

Mr. MARKEY. The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you.

Mr. Wells, I want to commend your company for its great energy efficiency. It has been a real leader, and our commendations to you.

Mr. WELLS. Thank you, Congressman.

Mr. INSLEE. Mr. Sokol, I don't know much about your company but I presume it considers itself responsible. I want to ask you about your solid-waste disposal programs. I presume you do not dispose of your solid waste on land which you don't own without permits, I assume. Is that correct?

Mr. SOKOL. I think I can say fairly we don't dispose of any waste in any location that is not properly permitted. I can't confirm to you that we own 100 percent of the land but I think it would be in the high 80s or 90s but I am not certain it is 100 percent.

Mr. INSLEE. Right. And I assume you don't believe that you own the atmosphere.

Mr. SOKOL. Clearly not.

Mr. INSLEE. And yet your testimony would suggest that you believe your company has the right to dispose of your gaseous waste in the form of carbon dioxide in an atmosphere which you do not own without charge and without regulation, and I don't understand how you take that position. Could you explain that?

Mr. SOKOL. Congressman, I don't know where in my testimony you see that. We have agreed for 5 years on these caps, actually

slightly more stringent. We have no issue with the cap on CO_2. If that is government policy, put it in place as we did the 1970 Clean Air Act, the 1990 amendments, and allow us to go meet it. We don't disagree with the early caps, the late caps. It is only the trading mechanism which becomes a duplicative cost without any help at all to the environment that we struggle with for our customers but we are not opposed to the caps, and if these caps are put in place we will meet them on time.

Mr. INSLEE. So you recognize the need for a limitation on the amount of carbon dioxide in the atmosphere but you expect the government to just give you a permit to that gratis to an unlimited amount——

Mr. SOKOL. Tell us what the limit is and we will meet it. That is all we are asking.

Mr. INSLEE. Well, we have a limit.

Mr. SOKOL. There is no limit today on CO_2.

Mr. INSLEE. Here is my question to you. We have set a limit in this cap. That means there is a limit on the amount of carbon dioxide that can go into the atmosphere. So some of——

Mr. SOKOL. Yes, we would meet that, and we don't want you to pay for us to do that.

Mr. INSLEE. Well, but somehow we have to figure out who is going to have the right to use that limit to cap, to dispose of CO_2 into the atmosphere, and you have suggested by objecting to this partial auction that somehow you should have full right to give as much as you want from your company without figuring how the next company will get its permit. I don't understand how you——

Mr. SOKOL. No, what the bill states for utility is that you would go back to our average 2005 CO_2 emissions rates and that we would have to reduce them pursuant to this cap in each of the years shown, and we are fine with that and we don't want anybody else's allocation, we don't want to go plant trees in Honduras. We will make technological changes——

Mr. INSLEE. But what gives——

Mr. SOKOL [continuing]. To our system to meet them pursuant to the cap.

Mr. INSLEE. What gives your company a right to, sort of a constitutional right to a permit to use a limited carrying capacity vis-a-vis some other company or some other ratepayer? In other words, why are your ratepayers sort of constitutionally entitled in your view to a free permit as opposed to my ratepayers or somebody in Florida or anywhere else? I just don't understand that.

Mr. SOKOL. I don't think they are. I am not asking for a free permit.

Mr. INSLEE. But you are asking for a free permit. You are essentially saying that you shouldn't have to buy in any auction at any price set by the market——

Mr. SOKOL. No, Congressman, I——

Mr. INSLEE [continuing]. For this limit asset. I don't understand that.

Mr. SOKOL. The last time I checked the Constitution, I have got a copy here, these assets are owned by us. We have operating permits today to operate them. The United States Congress is trying to make a decision to put limits on CO_2 and tell us that we can

emit less in the future, and we think that is appropriate government policy decision to make and when you make that we will comply with it. We are not asking you to give us anything. We are running these facilities today pursuant to State and federal law. They were regulated. Some of them are in the State of Washington, Oregon, Nebraska—or not Nebraska—Iowa, Wyoming, Utah, and you are asking us to reduce the amount of CO_2 we have emitted and we are saying we will do that.

Mr. INSLEE. Well, my concern is that, and I will just make a comment and I have got one more question. My concern is, we have limited ability to hand out, if you will, permits for a limited carrying capacity of the atmosphere, and when people come and want total free permits, they are asking for something that doesn't belong to them frankly. It belongs to the taxpayers and the citizens.

I want to ask a quick question of Mr. Farrell, if I can. We do have regional disparities by almost necessity, and I am not responsible for putting the Columbia River in the Northwest nor am I responsible for putting coal in the East.

Mr. FARRELL. It was Virginians who found the river though.

Mr. INSLEE. That is the way it should be, but we have tried to—isn't it fair to say that by having a half-and-half distribution model between the type of energy you have and that is half of the system, the base, half the amount, isn't that one way to try to address some of these regional disparities?

Mr. FARRELL. That is exactly what we are trying to accomplish, Congressman.

Mr. INSLEE. Thank you.

Mr. MARKEY. Thank you. The gentleman's time has expired. The Chair recognizes the gentleman from Arizona, Mr. Shadegg.

Mr. SHADEGG. Thank you, Mr. Chairman. When he left, Mr. Walden asked that this paper from the American Forest and Paper Association be put into the record. He had been asked by them to put it into the record. He forgot to do so. I ask unanimous consent to do so.

[The information was unavailable at the time of printing.]

Mr. MARKEY. Without objection, it will be included in the record.

Mr. SHADEGG. Thank you very much.

Mr. Sokol, I would like to clarify the question that just occurred because it confused me. The Clean Air Act, for example, regulates various pollutants, NO_X, SO_X, SO_2 and others, and it did that by simply setting limits. It did not charge a fee for emitting what was below the limit. Is that correct?

Mr. SOKOL. That is correct.

Mr. SHADEGG. And that is what you envision here?

Mr. SOKOL. Yes.

Mr. SHADEGG. You are willing to live with a limit as proposed in this legislation. As I understand it, you said you could live with a limit that was even lower than that. This notion of charging you for what you are currently emitting to allocate it between varies companies is something that would be completely new to the emissions of pollutants so far as I know. The Clean Air Act doesn't operate in that function, does it?

Mr. SOKOL. It does not, and the reference that people often make to the SO_2 trading situation from the 1990 Clean Air Act is completely unanalogous.

Mr. SHADEGG. Yes, I thought you did an excellent job of pointing out the differences in that. So you can meet the caps in this legislation. I think people listening to your testimony would like to have greater clarity on I think a fundamental point you made. You said the bill doubles the cost, that is, consumers are actually paying both to reduce carbon dioxide, presumably a good thing, but also paying for this tremendous trade mechanism that can be gamed on the other side. I believe in Europe it has been gamed. I would like you to take a moment and re-explain why you see it doubles those costs.

Mr. SOKOL. In our testimony that we filed for the record, you will see we have done it for each of our utilities. This is going to be very quick, but this bottom red line here is the amount of free allocations we will receive from this bill, our customers will receive. The black line is the stepping down of carbon obligation under your cap. We are a utility. Our natural gas plants emit CO_2, our coal plants emit CO_2. There is no technology commercially available today to take that CO_2 out of that air stream so what we have had to do is go with our regulator and say, look, if this is the requirements, here is how quickly we can replace those plants to meet these requirements. You don't build new generation in a day and new generation is not free. So that is laid out. Then between now and then, we just have to buy allocations up to the cap to continue serving our customers. Those two costs, the costs of compliance is $9.1 billion over 30 years to build those new plants and then the cost of just paying for the allocations again below the cap, we are already going to be at or below the cap, is another $9.3 billion that our customers will pay. That is the double cost. We are below the cap. Why should they be penalized more? And all that is, is a wealth transfer and a good portion of it going to States like Washington and California and others from the Midwest and it doesn't make any sense.

Mr. SHADEGG. Well, and the trading market itself, at least if we look at what happened in Europe, has made a number of people rich. That has allowed people to get rich off of the trading scheme itself, hasn't it, and is that a part of your objection or is that not a part of your objection?

Mr. SOKOL. Well, it is not only an opportunity for the gaming of the system, which will be massive. There was a recent article written that said within 3 years it will be larger than the trading of petroleum as a commodity market, and that is over $1 trillion a year. But secondly, our industry doesn't need it. Just set the permits where they need to be and make us go do it.

Mr. SHADEGG. Got it. Some of us would agree with that.

Quickly, this hearing is on the allocations. It looked to me like your testimony pointed out that the allocations as between electricity generation and high-intensity energy users, language that I think was negotiated by one of my colleagues from Pennsylvania, is not fair or equitable and the same with regard to the auto industry. Is that correct?

Mr. SOKOL. Well, I think there is a whole number of elements here that people in good faith probably tried to negotiate to be fair but this is a massive question and the allocation of fairness—there should be weeks of regulatory hearings where people can submit information to get these unintended consequences known. I mean, if you want to make a bad decision, you know, you are Congress and I am fine with that, you have the prerogative, but at least know the decision you are making, and that is what is not happening and this is a reordering of the American economy.

Mr. SHADEGG. Mr. Cousins, as I understood your testimony, which I thought was quite clear, there is no question but that at the cost of this legislation, which you said could not be passed on 100 percent, that being, I guess I calculated it about seven times what your profit has been in the past, 13 to 100 million, it would drive you out of business.

Mr. COUSINS. Yes, sir.

Mr. SHADEGG. Mr. Barton asked you about the number of job losses that would produce and you said direct and indirect were how many?

Mr. COUSINS. Direct were 1,200 and indirect were 3,600.

Mr. SHADEGG. At your——

Mr. COUSINS. At our facility.

Mr. SHADEGG. And are there similar refineries that would be in the same position?

Mr. COUSINS. Yes, there are. There are approximately 36 small refiners in the small category that are our size roughly spread all out in rural areas, and most of those would be equally vulnerable.

Mr. SHADEGG. I have one last question. It seems to me that in part this bill is being sold as a way to make us less dependent on foreign energy sources yet the story you told about the refinery built in India to deliver product to the United States, not to India, combined with this bill driving your company out of business, I guess you perceive this bill's impact resulting us having less refining capacity in the United States and driving us or forcing us to use foreign suppliers rather than domestic. Is that correct?

Mr. COUSINS. In the near term I think that is absolutely correct. In the long term, I think that is beyond my ability to predict.

Mr. SHADEGG. Thank you very much.

Mr. MARKEY. Great. The gentleman's time has expired. All time for questions from the subcommittee members has now expired. We thank you all so much. This was a very valuable hearing. It is helping us to focus on the very important issues at the heart of this legislation. With the thanks of the committee, this hearing is adjourned and we ask the witnesses to stay close to us. We are going to need additional conversations with you. Thank you.

[Whereupon, at 1:46 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

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Dominion

July 22, 2009

Mr. Earley Green
Chief Clerk
Committee on Energy and Commerce
Room 2125
U.S. House of Representatives
Washington, DC 20510

Dear Mr. Green,

Please find enclosed Dominion's responses to the questions for the record from the Committee's hearing entitled "Allowance Allocation Policies in Climate Legislation: Assisting Consumers, Investing in a Clean Energy Future, and Adapting to Climate Change."

We are grateful for the opportunity to appear before the Committee. Please do not hesitate to contact me if you require any further information from Dominion.

Sincerely,

Robert M. Blue
Senior Vice President
Public Policy and Corporate Communications

Enclosures

Dominion Resources Services, Inc.
400 North Capitol Street, NW, Suite 875
Washington, DC 20001

Question from Congressman Burgess

Could you please describe the process Dominion will use to apply for allowance allocations? To whom will you apply, what type of information will you send, and how will you receive delivery of the allocations?

The American Clean Energy and Security Act of 2009 requires the Administrator of the Environmental Protection Agency (EPA) to establish a federal greenhouse gas registry for covered entities who emit more than 25,000 tons of carbon dioxide equivalents annually. Under this registry program, Dominion will report to EPA annual emission levels of any of the seven designated greenhouse gases. Section 713 sets forth minimum contents for the EPA regulations to establish the federal greenhouse gas registry. This provision requires covered entities to submit sufficient data to ensure compliance with the Global Warming Pollution Reduction Program. The bill requires EPA to collect data that is complete, consistent and accurate. CO2 emissions from Dominion's electricity generating stations will be, in large part, measured by continuous emission monitoring systems. Other Dominion emission sources are likely to use alternative technologies approved by EPA as provided for in the legislation. Reporting of our emissions will be used as a basis to determine that we are meeting the compliance obligations provided in Title III for electricity sources, including emissions from Dominion's electricity local distribution company, our merchant coal generating sources, and our natural gas local distribution company.

Section 783 provides for the distribution of allowances by the Administrator to electricity consumers and Section 784 provides for the distribution of allowances to natural gas consumers. Within the 30 percent of annual allowances that the bill designates for electricity local distribution companies, Dominion will provide information to EPA on our historic carbon dioxide emission levels from the three-year baseline (between 1999 and 2008) we select and on our average annual retail electricity deliveries from the three-year baseline (between 1999 and 2008) that we select. EPA will collect information from each local distribution company and will consult with the Energy Information Administration on the most current data on the average amount of carbon dioxide emissions attributable to electricity generation. The Administrator is also required to update the data on retail electricity deliveries every three years and make necessary adjustments in the distribution of emission allowances. Allowances to Dominion's natural gas local distribution company will be distributed based on our annual average retail natural gas deliveries from a base period of three consecutive years between 1999 and 2008 that we select. The Administrator is directed to update the natural gas LDC distribution formula to reflect any changes in natural gas LDC service territories.

The legislation sets program rules for emission allowances in Section 721 that requires EPA to give each allowance an individual identification number for each vintage year. Section 783 requires EPA to distribute allowances to covered entities within the electricity sector by September 30 each year, beginning in 2011. Section 722 details a covered entity's allowable emissions levels as the number of emission allowances or offset credits it holds as of April 1 of each year, beginning in 2013.

Dominion Resources Services, Inc.
400 North Capitol Street, NW, Suite 875
Washington, DC 20001

Question from Congressman Burgess

Does Dominion plan on trading carbon credits in a market? If so, please describe the process Dominion will use to trade carbon allowances.

Dominion intends to use all of the mechanisms, including banking, borrowing and trading, available under the legislation to comply with the Global Warming Pollution Reduction Program. As part of this compliance strategy, Dominion would trade carbon credits as appropriate to mitigate risk and to avoid unnecessary costs for our customers. Dominion would not envision trading as speculation, expecting the price to rise or fall in order to exit the position at a later date. Dominion would view appropriate trading as a tool to manage risk on behalf of its customers.

July 21, 2009

The Honorable Michael Burgess
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Environment

RE: Response to Follow-Up Questions from June 9, 2009 Testimony of G. Tommy Hodges, Chairman, Titan Transfer, Inc., and American Trucking Associations First Vice Chairman

Dear Representative Burgess:

Thank you for the opportunity to testify before the House Committee on Energy and Commerce, Subcommittee on Energy and Environment's recent hearing entitled *Allowance Allocation policies in Climate legislation: Assisting Consumers, Investing in a Clean Energy Future, and Adapting to Climate Change.* This letter responds to your specific request below for additional information and represents the positions supported by the American Trucking Associations (ATA).

The Honorable Michael Burgess

According to the Energy Information Administration, the national average price of diesel fuel was $4.15 on May 9th, 2008. The average fuel tank for most commercial vehicles will hold 300 gallons of diesel fuel and 18-wheeler trucks average between 4.5 and 7.7 mpg depending upon load size and driver pedal use, but 5.5 mpg is a standard average. At $4.15/gallon it would cost $1,245.00 to fill a 300 gallon tank to travel 1,650 miles over $.75 per mile.

High diesel prices create higher costs for goods transported over-the-road. These costs are then carried over to American consumers hurting a weakened economy and limiting any attempts for economic recovery. What type of impact will H.R. 2454 have on the price of diesel fuel?

The trucking industry is concerned that H.R. 2454 will significantly increase the price of diesel fuel we consume. Numerous experts have indicated that climate change legislation will dramatically increase the price of transportation fuels. One major petroleum supplier to the trucking industry has advised that fuel costs could rise by up to 77 cents per gallon for gasoline and 88 cents for diesel fuel. While various studies predict different fuel cost increases, not one study forecasts a decrease in fuel costs as a result of H.R. 2454.

In 2008 trucking consumed over 39 billion gallons of diesel fuel. This means that a one-cent increase in the average price of diesel costs the trucking industry an additional $390 million in fuel expenses. Fleets spent an astonishing $151 billion on fuel in 2008, a $36 ***billion*** increase from 2007 and more than double the amount spent in 2004. The cost of diesel fuel is normally a company's highest or second-highest operating expense.

In my written testimony I provided what type of impacts increased diesel fuel costs caused by climate change legislation might mean to a company such as mine. This example is worth repeating. I run 450 tractors, operate 1,250 trailers, and employ 470 hard-working professional men and women. My company consumes 30 million gallons of diesel fuel annually. At this volume, $2/gallon diesel fuel equates to a fuel bill of $60 million/year; at $3/gallon, $90 million/year; and at $4/gallon, $120 million/year. While it is difficult to predict how much fuel prices will increase under H.R. 2454, let us assume four scenarios of diesel fuel increases: $.10/gallon, $.25/gallon, $.50/gallon, and $1.00/gallon. For my company, that would mean an additional cost burden of $3 million, $7.5 million, $15 million, and $30 million per year respectively, costs that will be difficult to absorb. Diesel fuel price increases exceeding these scenarios will further devastate the movement of this nation's freight. In addition to the direct costs associated with the proposed carbon reductions in H.R. 2454, speculation in the emerging carbon markets may further increase fuel costs leading to uncertain and unstable energy market futures and throwing our best business planning out the window.

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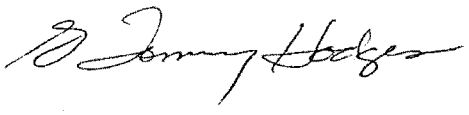
I again thank you for the opportunity to provide information to the Committee on this issue of significant importance to the nation's trucking industry. If you have any questions concerning these responses, please contact Glen Kedzie, ATA's Vice President and Environmental Counsel at 703-838-1879 or gkedzie@trucking.org.

Respectfully submitted,



G. Tommy Hodges
Chairman
Titan Transfer, Inc., and American Trucking Associations First Vice Chairman

CC: Earley.Green@mail.house.gov
Jennifer.Berenholz@mail.house.gov

Response by Dr. W. David Montgomery
to questions for the record from
the Honorable Joe Barton
Subcommittee on Energy and Environment
June 9, 2009

1. **Would you please comment on the recent CBO cost estimate and analysis of household impacts of H.R. 2454, and compare their findings to results of your study?**

CBO makes many valid points in its discussion of HR2454, including raising important questions about the likelihood that all the international offsets authorized by HR2454 will be available, and recognizes some of the limitations of its type of analysis. Nevertheless, I believe that CRA's analysis uses a superior set of models and provides more realistic estimates of costs. In particular,

- CBO has a lower estimate for permit prices than CRA: CBO's permit price estimate is based an average of the results of several models, almost all of which lack a sufficiently realistic picture of the electric sector to capture all near-term costs.

- CBO ignores broader impacts on GDP: CBO admits it did not include impacts on GDP that would likely result from the enactment of H.R. 2454. These include decreases in employment, wage reductions, and reductions in the productivity of capital and labor. These costs are front-loaded on consumers as resources are diverted from productivity enhancing projects to replacing prematurely retired electric generation. For 2015, we estimated costs 7 times larger than CBO's.

- Both CBO and EPA highlight the large potential impact of non availability of international offsets. CBO comments that it is unlikely that anything close to the amount of international offsets included in EPA's calculations will be available in the early years of the program.

- I believe that CRA's analysis contains the most reliable estimates of the household costs: CRA's MRN-NEEM is the only model used to analyze H.R. 2454 that contains the combination of a detailed technology representation within the electrical sector (where the majority of reductions are expected to take place) and a macroeconomic model that can capture the direct and indirect changes in the economy that would result from a policy such as H.R. 2454. Our study for the National Black Chamber of Commerce found that increased costs per household would range from $600 to $1,600 in 2020 and $650 to $1,900 in 2050.

I have included a more detailed analysis of CBO's analysis and that of EPA in Attachment A.

a. Please provide a copy of your study of the economic impacts of HR2454 as referenced in your testimony

CRA's report for the National Black Chamber of Commerce is provided as Attachment B.

b. Please provide copies of previous critiques of your analyses of climate change legislation and your responses to those critiques, including in particular answers provided by CRA Vice President Anne Smith to questions on her Senate testimony and your responses to statements made about your work by Environmental Defense

Our analysis of the potential economic costs of climate legislation has been subjected to misinformed attacks and character assassination ever since Congress started consideration of specific legislation. These attacks have consistently misrepresented the assumptions made in our studies and the nature of CRA's models, made inaccurate statements that CRA's models have not been peer-reviewed, and claim incorrectly that we have consistently estimated higher costs than other modelers. Many of these claims were repeated by the witness for Environmental Defense in these hearings, even though we have repeatedly refuted their statements.

The first of these inaccurate attacks was made by Senator McCain and published in the Congressional Record for Wednesday, June 22, 2005. I have enclosed in Attachment C a copy of the Senator's remarks, the letter I sent to him in response, and a detailed four-page rebuttal.

On November 8, 2007 my colleague Dr. Anne Smith testified at the Senate Environment and Public Works Committee. Another witness at the hearing, Jonathan Pershing, who had not read CRA's report, testified that he believed our cost estimates were biased because we assumed unreasonable constraints on the introduction of new technology. In a subsequent hearing on November 13, 2007 David Hawkins repeated similar claims about how our modeling ignored low cost opportunities. I have enclosed in Attachment D a copy of Dr. Anne Smith's response to post-hearing questions from Senator Inhofe dealing with these issues, which effectively demonstrates that CRA's assumptions are comparable to those in other in other studies and in many cases very optimistic.

In Attachment E I have included a rebuttal prepared by CRA to claims about our analysis of the Lieberman-Warner bill that were being circulated anonymously in March 2008. We understand that Environmental Defense was responsible for many of these statements, and at the hearing the witness representing Environmental Defense repeated these claims almost word for word in his answers to Mr. Markey, stating that CRA has consistently estimated costs far higher than all other models. This letter provides extensive documentation of how that is not true, and that when CRA did estimate higher costs it was because we were the only modeling group that addressed the actual provisions of the bill under discussion, rather than assuming more lax standards or easier access to offsets than the bill allowed.

Finally, in Attachment F I have provided a copy of an overview presentation made at the workshop convened by the Electric Power Research Institute on May 8, 2008 to compare all the studies that had been done of the Lieberman-Warner bill. Slide 4 demonstrates that CRA was solidly in the middle of the pack.

2. How effective are free allocations of allowances in creating an equitable distribution of costs across regions and income groups? And are there more effective ways to deliver that compensation?

In my testimony I presented recent analysis by me and my colleagues showing that the allowance allocations devised in the Committee's version of H.R. 2151 left large differences in energy cost and in household impacts across regions, and provided the largest benefit to the richest regions and the smallest benefit to the poorest regions. I believe it will be very difficult to use free allocations of allowances to various industry sectors, technology subsidies and state programs to achieve an equitable distribution of costs across individuals and households. Very little, if any, of the value of allowances has been directed to the actual people of the United States, in either the formulae worked out last year in the proposals by Senators Lieberman and Warner and Senator Boxer or in the current Waxman-Markey bill. At best, allowances are awarded to intermediaries like gas and electric utilities and state governments to devise programs that will ultimately pass some of the value along to individuals. The formulae used do not appear to be sensitive to need, either in terms of income or of who is actually bearing higher energy costs.

Economists have generally agreed that the best use of the value of carbon allowances would be achieved through a 100% auction – or even more simply through a universal carbon tax – with the revenues used to satisfy budgetary needs in lieu of increases in taxes that create a substantial drag on the economy – such as the proposed increases in marginal tax rates on individual incomes to pay for health care.

If reducing high marginal tax rates on individuals and businesses is not politically feasible, the proceeds from a 100% auction could be sent directly to individuals through a number of mechanisms. The simplest form would be a uniform per capita payment to every legal resident of the United States, but to achieve greater equity that payment might be determined through a formula that took into account regional income and cost differences. To deal with those who do not file or appear on tax returns and cannot otherwise be identified from existing records, some fraction of the proceeds could be given to state governments. But this would have to be under strict conditions that the entire amount be used either to reduce taxes – such as sales taxes that are particularly burdensome to the poor – or delivered in cash to the most needy using existing social service programs to identify recipients who could not be reached otherwise.

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