



October 16, 2009

The Honorable Henry A. Waxman
Chairman
House Energy and Commerce Committee
2125 Rayburn House Office Building
Washington, DC 20515-6115

Dear Chairman Waxman:

Per your request of October 2nd below are our responses to your questions concerning the Center for Data Analysis economic modeling of H.R. 2454, the American Clean Energy and Security Act. Thank you for the opportunity to further explain our work concerning this legislation. To ensure as much transparency as possible, we will post these responses to our website, heritage.org, and will be encouraging the other organizations and government agencies who received your request to also post their responses online. We would also encourage you to release all of the responses you receive to the public in a timely manner.

Since several other organizations such as CBO, the Political Economy Research Institute, and the Brookings Institution were omitted from your request we have sent them letters requesting their answers as their research has also been widely used.

If you or your staff have any additional follow up questions please do not hesitate to contact Dan Ziegler, our House Relations Deputy, at dan.ziegler@heritage.org or 202-608-6063.

Sincerely,

Dr. David Kreutzer
Senior Policy Analyst in Energy Economics and
Climate Change
Center for Data Analysis

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Responses to Chairman Waxman's faxed questions of October 2, 2009

Details on the analytical approach behind the economic model(s) used in the analysis

1. Does the model quantify any benefits of avoided climate change? If so, how?

Our model analyzes the impacts on years 2012-2035. Since estimates, based on the IPCC sensitivity factors, project a temperature impact of 0.05 degrees C (about 0.09 degrees F) by 2050. There would be negligible avoided climate change by 2035. The goal of our modeling is to show policy makers the probably extent of economic change stemming from the policy changes contemplated by Waxman-Markey. Our analysis shows significant economic dislocation.

2. Does the model quantify the benefits of reductions in air pollution (Clean Air Act criteria or hazardous air pollutants) which will occur as a result of the policy? If so, how?

No. Nor did we analyze the impact of moving production from relatively cleaner domestic manufacturing to less clean production in the developing world.

3. Does the model quantify benefits from provisions that remove barriers to cost-effective energy efficiency measures? If so, how?

Our reading finds the bill removes no such barriers. However, the much slower economy resulting from Waxman-Markey would reduce economic opportunities and slow income growth. Both effects would be felt most by those least able to bear the cost: low-income households and young Americans just starting their work lives.

4. Does the model capture increased private sector investments in research and development as a result of the legislation and new carbon market? If so, how?

Yes. The model incorporates both short and long-run responses to higher energy prices. These long-run responses, especially, incorporate the changes in investment behavior on the part of both consumers and producers of energy, energy-intensive capital, and energy substituting technology.

5. What assumptions are made about international actions to reduce emissions?

We assume the current array of carbon reduction measures at work in the economies of our principal trading partners.

6. Have you reported a state or regional level analysis within the United States? If so, describe the additional assumptions used.

The operation and assumptions for our macroeconomic analysis are described in the methodological appendix of our August 6, 2009 CDA Report, available here: <http://www.heritage.org/Research/EnergyandEnvironment/cda0904.cfm>. This modeling formed the basis for allocating national results to states and congressional districts.

7. Many models are calibrated against a single base year. If this is the case with your model, what year is used?

Our base year is the November 2008 30 year forecast from IHS/Global Insight Macroeconomic Model.

Reference case assumptions

1. Does the analysis rely on a preexisting, public set of reference case assumptions (e.g. Annual Energy Outlook (AEO) 2009)? If so, please provide the source information and list, in detail, all modifications that were made to the reference case.

The analysis used the IHS Global Insight's Energy Model. The 2008 version of the model was re-run with the 1st quarter macroeconomic results from IHS Global Insight's US Macroeconomic Model, which included the assessment of the impact of the recession.

2. If a preexisting set of reference case assumptions was not used, what are the reference case assumptions for changes in gross domestic product, population, emissions, energy (fossil and renewable fuel) use and energy prices? What are the assumed costs and performance of technology options (wind, solar, nuclear, biomass, carbon capture and sequestration (CCS))?

The underlying technology assumptions are based on data from EIA.

3. Are existing federal and state policies included in the model (e.g. Corporate Average Fuel Economy (CAFE), other Energy Independence and Security Act of 2007 (EISA) provisions, state renewable portfolio standards, state cap and trade systems, utility decoupling)? If so, how?

All existing federal and state energy mandates are included in the reference case. Over the long-term, it is assumed that evolutionary change in regulations will continue. We do not make a specific assumption about electric rate decoupling.

4. Are any recently enacted or adopted energy or climate policies not represented in the model (e.g. H.R. 1 or recently revised CAFE standards)? Are the recently proposed greenhouse gas standards for light duty vehicles incorporated into the reference case?

The simulation included the EISA standards for light-duty vehicle efficiency. The Obama proposal to move the EISA efficiency standard up to 2016 was made May 19th and was not included in the baseline. Note that these mandates do not reduce the cost of meeting the emissions caps, but they would affect the portion of the costs attributable to the legislation.

5. Does the reference case capture how concerns over greenhouse gas emissions, especially expectations of greenhouse gas regulation, impact the behavior of investors? If so, how is this modeled (e.g. AEO 2009 adds a cost penalty when assessing investments in greenhouse gas-intensive technology)?

No. Our focus is to show how the Waxman-Markey legislation will affect the incomes, savings, investments, and employment opportunities of ordinary Americans. It is a macroeconomic analysis that encompasses the effects on financial markets and the investments of the corporate sector. Our analysis shows that Waxman-Markey would substantially reduce the pace and level of economic activity.

6. Does your reference case include any regulations that would be adopted by EPA, as required under current Clean Air Act authority (i.e. Massachusetts vs. EPA), or any other clean energy policies likely to be adopted by Congress over the time scale of the model?

The EPA has not issued any regulations and none are assumed.

Policy case assumptions

1. Does the analysis model H.R. 2454? If so, which version of H.R. 2454 (discussion draft, as introduced, reported from committee, reported from the House of Representatives) is modeled?

The version of H.R. 2454 as reported from the House of Representatives is modeled.

2. Does the model constrain the adoption of new or existing technologies in the policy case (e.g. nuclear, CCS, solar, biomass or wind)? Please describe any limits in detail.

The model projects no additional nuclear, solar, wind, or biomass beyond those motivated by the existing, federal, state, and regional mandates and programs. CCS is not commercially and politically feasible before the 2035 horizon of our analysis. The reference case includes 15 gigawatts of net new nuclear power by 2035; biofuels for light-duty vehicles rise from 8.9 billion gallons per year in 2008 to 33.4 billion gallons per year in 2035; electricity generation from renewables (not including conventional hydropower) rises from 133 terawatt-hours in 2008 to 641 terawatt-hours in 2035.

3. Does the model capture the benefits of federal research & development expenditures on technology deployment and cost? If so, how?

The model assumes that federal expenditure on technology research and development has a benefit equivalent to like expenditures elsewhere in the federal budget.

4. How does the model capture supplemental energy efficiency policies in the legislation? Please list any energy efficiency provisions which have been modeled.

The energy efficiency policies of the legislation are mandates that neither raise the emissions caps nor provide lower-cost options that would be unavailable through markets. As such, the efficiency policies can only increase the costs of meeting the caps. Our model makes the best case assumption that these policies do not raise the costs.¹

5. How does the model capture supplemental policies in the transportation sector? Please list the transportation sector provisions which have been modeled.

The energy efficiency policies of the legislation are mandates that neither raise the emissions caps nor provide lower-cost options that would be unavailable through markets. As such, the efficiency policies can only increase the costs of meeting the caps. Our model makes the best case assumption that these policies do not raise the costs.

6. How does the model capture supplemental policies in the electric power sector? Please list the power-sector policies which have been modeled.

The energy efficiency policies of the legislation are mandates that neither raise the emissions caps nor provide lower-cost options that would be unavailable through markets. As such, the efficiency policies can only increase the costs of meeting the caps. Our model makes the best case assumption that these policies do not raise the costs.

7. How does the model capture supplemental policies in the industrial sector (e.g. output-based rebates)? Please list the supplemental policies in the industrial sector which have been modeled.

The energy efficiency policies of the legislation are mandates that neither raise the emissions caps nor provide lower-cost options that would be unavailable through markets. As such, the efficiency policies can only increase the costs of meeting the caps. Our model makes the best case assumption that these policies do not raise the costs.

¹ This position on mandates is not unique to Heritage. For instance, in “Fuel Efficiency Standards: A Detour from the Cheapest Climate Protection,” The Brookings Institution, February 3, 2009, Adele Morris of The Brookings Institution makes this point in regard to California mandates: “Proponents argue that higher fuel economy standards are part of the climate solution. But once the emissions caps are set and firms are trading rights to emit, fuel economy and other regulatory standards produce no incremental climate benefits... Because mandating greater automotive fuel efficiency tends to be a more costly way to reduce emissions than other methods, the California rules could only end up increasing the cost of achieving the emission target without providing additional climate benefits.”

8. How does the model incorporate the banking and borrowing provisions of the bill? If the model's outlook is shorter than that of the bill, how is the bank balance determined for the last year of the model? What interest rate is used to determine banking behavior?

The model does not incorporate banking or borrowing. The model's time horizon is 2035. The models that do incorporate banking and borrowing project net borrowing up through this point. Therefore, incorporating banking and borrowing would have raised the overall economic costs for the period analyzed.

9. Please list any sections of the legislation which have not been modeled. List separately any policies assumed in the policy case which are not in the legislation.

The model analyzes only the costs of meeting the emissions caps in the energy sector. The model did not include costs of meeting the caps for greenhouse gases other than CO₂.

10. How are allocations of emission allowances or revenues from auctions of such allowances recycled into the economy in the model?

Heritage analysts assumed that the revenue value of permits equals the entire value of these permits as government revenue, regardless of whether they are formally auctioned. If the government chooses to transfer ownership of the permits to other entities, that would be reflected as a transfer payment in the national income accounts. The allocation of the value of this revenue is a source of much debate among the legislators. Heritage analysts allocated the revenue as much as possible, given the sparse detail in the memo "Proposed Allowance Allocation" by Chairman Henry A. Waxman and Chairman Edward J. Markey dated May 14, 2009. Any unallocated allowance revenue remained in the federal government's general consumption variable and was thus allocated by the model in ways consistent with the historical pattern of government spending. Specifically, the allowance value was transferred to individuals in the form of non-Medicare or Social Security full-employment transfers (as opposed to an aid transfer driven by an economic downturn like an unemployment benefit transfer). The various transfers specified in the memo amounted to 15.5 percent of the value transferred until 2021, and 16 percent of the value transferred to individuals thereafter.

Revenues allocated to state and local governments were more complicated. These were: 11.5 percent in 2012 to 2015; 9 percent in 2016 to 2017; 8 percent in 2018 to 2021; 6.5 percent in 2022 to 2025; 6 percent in 2026; 5.75 percent in 2027; 5.5 percent in 2028; 5.25 percent in 2029; and 5 percent in 2030 to 2035.

The state and local transfers were then allocated as transfers of aid to individuals in the amount of 1.5 percent of state funds through 2030. The remaining allowance value that was given to states and not transferred to individuals was put in the state and local general consumption variable and allocated by the macro model according to the historical pattern used for these funds. (At the state and local levels these historical uses are largely additional transfers to individuals.)

The macro model would have deficit-financed this increased spending rather than recognize the value as being generated by the allowances purchased (explicitly or implicitly) in the private sector. The variable for federal government tax receipts on production and imports other than from a value-added tax was increased by the value of the allowances to account for the increased revenue generation. This allowed the macro model to more accurately forecast the likely debt burden, interest rate effects, and so on, as well as the tax burden on the private sector by this transfer to government.

11. Are any rebates to households (or firms) through local distribution companies (LDCs), tax cuts, dividend checks, or other mechanisms captured in the model?

Per the legislative intent, the model does not allow rebates to reduce energy prices (marginal costs). Transfers were made to households from federal, state and local governments.

12. What are the assumptions for domestic and international offset supply and cost (i.e. what offset marginal abatement cost curves are used and have they been modified in any way for the purposes of this analysis)? Please describe, in detail, any limits placed on the supply or usage of offset for compliance.

The model assumes total offsets will equal 15 percent of the allowed emissions in addition to the allowed emissions.

13. Please outline the key differences between the primary policy scenario and any sensitivity scenarios.

A single policy scenario was analyzed. However, the baseline employed is the result of testing a number of alternative and highly likely paths that the economy could take between now and 2035.

Details on the interpretation and presentation of results

1. Are policy case outputs presented in comparison to the appropriate corresponding reference case scenario (e.g. is a high oil price reference case used for comparison to a policy case with high oil price assumptions)?

The single policy case analyzed corresponded to the baseline (reference) case.

2. Are statements about the impact of the legislation made relative to current levels or relative to the appropriate reference case year?

All costs are relative to the baseline case for the appropriate years.

