An Overview of Climate Legislation Studies Used in the Cap & Trade Debate

	Name of Study/Date	Sponsor	Consultant/Author	Legislation Analyzed	Impact on United States	Impact on Ohio	Basics of Methodology	What model was used?	Discount Rate	2020 Opportunity cost (limits to GDP compared to BAU)	2020 Allowance Price	2020 Opportunity Cost (Household)	2030 Opportunity cost (GDP)	2030 Allowance price	2030 Opportunity cost (household)	2050 Opportunity cost (GDP)	2050 Allowance Price	2050 Opportunity cost (household)
1	Appendix C: Cost of Climate Policy and the Waxman-Markey American Clean Energy and Security Act of 2009 (H.R. 2454)1 (April 2009)	MIT - Joint Center on the Science and Policy of Global Climate Change	Sergey Paltsev, John M. Reilly, Henry D. Jacoby and Jennifer F. Morris	American Clean Energy and Security Act of 2009, HR 2454	GDP to grow from $12,614 Billion in 2005$$ to $38,349 in 2005 $$, an increase of 204% by 2050. *"We estimate average annual net present value <opportunity cost> of H.R. 2454 of about $400 per household over this horizon, but given different assumptions about the availability of offsets this estimate ranges from as low as $180 to as high as $470. "*	N/A	AEO 2007 (without emissions reduction standards); technology and efficiency were not modeled. Cumulative opportunity costs of a low of 1198 and a high of 1701 (not discounted) divides out to annual opportunity cost of 32 to 45 dollars. This is within the context of compounded annual GDP growth.	MIT Emissions Prediction and Policy Analysis Model - EPPA (A component of MIT's Integrated Global System Model - IGMS) AEO March 2009	4% discounted to $2005	Low Scenario - (.69%) High Scenario - (.88%)	Low - $7; High - $21	Low scenario - $127 High Scenario - $241	Low - (0.88%) High - (1.47%)	Low - $13; High - $26	Low - $146 High - $541	Low - (1.28%) High - (2.15%)	Low - $29; High - $84	Low - $258 High - $676
2	Analysis of The Lieberman-Warner Climate Security Act (S. 2191) (April 2008 - CHECK)	American Council for Capital Formation/National Association of Manufacturers	Science Application International Corporation (SAIC)	Lieberman-Warner 2007, SB 2191	GDP grows between 2007 and 2030 by 2.6 percent under baseline scenario and by 2.5 percent under their high-cost case but focus is on 'opportunity cost' in terms of jobs not created and household budget not earned.	Annual opportunity cost to household budgets: ($902) to ($2924) per year by 2020 and ($3739) to ($6819) by 2030. Opportunity cost in terms of jobs not created identified as 107,000 to 143,000 for 2030.	Uses National Energy Modelling System and estimates impact on economy of increased energy prices due to cap and trade law, reports results relative to baseline.	NEMS/ACCF/MAM econometric model <National Energy Modeling System (NEMS) Macroeconomic Analysis Model (MAM) with assumptions provided by ACCF>	Discounted to $2007	Low Senario - (0.8%) High Scenario - (1.1%)	Low - $55 High - $64	Low scenario - $739 High Scenario, $2927	Low - (2.6%) High- (2.7%)	Low - $227 High -$271	Low - $4022 High - $6752	N/A	N/A	N/A
3	State by State Fact Sheets: ACCF/NAM high cost case Forecasts of Cap & Trade Legislation (April 2009)	Political Economy Research Institute, University of Massachusetts at Amherst (PERI)	PERI; Robert Pollin and Ben Zipperer	Lieberman-Warner 2007, SB 2191	Uses same economic data as in ACCF/NAM study above: GDP rises by 75% by 2030; Income increases by 41%; Employment grows by 11.5%. Focus is on growth not on opportunity costs.	Using same economic forecasts as ACCF/NAM study above, focuses on growth, not opportunity cost: gross state product grows by 59%by 2030; Income by 58%; employment rises by 11.5% or about 48,000 jobs.	Uses the ACCF/NEMS data and presents it relative to today; estimates effect of shifting 25% of spending on fossil fuels into green energy	Used ACCF/NAM results from NEMs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Cap & Dividend: A State by State Analysis (August 2009)	Political Economy Research Institute, University of Massachusetts at Amherst (PERI) and Economics for Equity and the Environment Network (E3 Network)	PERI (U Mass Amherst)	American Clean Energy and Security Act of 2009, HR 2454	Over time, 'cap and dividend' approach yields a modest advantage at the bottom of the income scale and a modest cost at the upper end of the income scale.	A $58 annual benefit in the bottom decile ranges to a $272 cost at the very top of the earning scale under a scenario where all auction proceeds are returned to households.	Looks at price impact on household budgets by average household size within income deciles. Assumes $25/T emissions price and 80% of auction proceeds are given back to consumers as a flat fee.	This was based on analysis of energy costs and household budgets but was not an econometric model.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	The Economic Benefits of Investing in Clean Energy: How the Economic Stimulus Program and New Legislation Can Boost U.S. Economic Growth and Employment	Political Economy Research Institute, University of Massachusetts at Amherst (PERI) and Economics for Equity and the Environment Network (E3 Network)	Pollin, Robert	Heintz, James	Garrett-Peltier, Heidi	American Clean Energy and Security Act of 2009, HR 2454	ARRA investments in energy combined with the provisions of ACES operating together calculated to pump roughly $150 billion per year in new clean-energy investments in the United States over the next decade.	This estimated $150 billion, notably dominated by private-sector investments, generates a net increase of about 1.7 million jobs.	Our research finds that Ohio could see a net increase of about $5.6 billion in investment revenue and 67,356 jobs based on its share of a total of $150 billion in clean-energy investments annually across the country. This is even after assuming a reduction in fossil fuel spending equivalent to clean energy investments.	US Department of Commerce's Input-output model based on current detailed industrial survey data of U.S. business activity; this provides estimates of how employment levels would change when the proportions of overall spending on energy shifts from high-carbon sources to clean-energy and energy efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Ecnomic Impact of Waxman Markey: "American Clean Energy and Security Act of 2009" (HR 2454) (August 2009)	American Council for Capital Formation/National Assocation of Manufacturers	Science Application International Corporation (SAIC)	American Clean energy and Security Act of 2009, HR 2454	GDP growth is positive but limited by energy prices; focus is on 'opportunity cost' in terms of jobs not created and household budget impact	Annual opportunity cost to household budgets: ($133) to ($261) per year by 2020 and ($873) to ($1,419) by 2030. Opportunity cost in terms of jobs not created identified as 79,700 to 108,600 for 2030.	Uses National Energy Modelling System and estimates impact on economy of increased energy prices due to cap and trade law, reports results relative to baseline.	National Energy Modeling System (NEMS) Macroeconomic Analysis Model (MAM); presents a low cost case with a high cost sensitivity analysis (AEO April 2009)	$2,007	Low Senario - (0.5%) High Scenario - (.8%)	Low - $77 High - $99	Low scenario - $339 High Scenario, $564	Low - (1.8%) High - (2.4%)	Low - $123 High - $159	Low - $730 High - $1248	N/A	N/A	N/A

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7	Energy Efficiency in the American Clean Energy and Security Act of 2009: Impacts of Current Provisions and Opportunities to Enhance the Legislation (September 2009)	American Council for an Energy Efficient Economy	Rachel Gold, Laura Furrey, Steven Nadel, John "Skip" Laitner, and R. Neal Elliott	American Clean Energy and Seucrity Act of 2009 (HR 2454)	Energy efficiency savings in HR 2454 could save households an average of $486 annually and couldcreate 600,000 new jobs.	Boost household income by$183 in 2020 and $469 in 2030 on the average, in 2007$$; increase employment in Ohio by 16,400 in 2020 and by 26,000 in 2030	ACEEE's analysis focuses on provisions from the Clean Energy (Title I) and Energy Efficiency (Title II) titles in ACES as well as allocations of carbon allowance revenues from certain cap-and-trade provisions in Reducing Global Warming Pollution (Title III)	Excel model; reference case is AEO April 2009; carbon prices from EPA 2009 study (ADAGE/IGEM)	Discount rate of 4.5%; $2007	N/A	2015 Low - $13 High - $13	Net increase of 215	N/A	Low - $26 High - $27	Net increase of 486	N/A	N/A	N/A
8	The Economic Benefits of Investing in a Clean Energy Economy	Center for American Progress	Political Economy Research Institute University of Massachusetts at Amherst (PERI)	American Clean Energy and Seucrity Act of 2009 (HR 2454)	Net 1.7 million created; 50% require high school diploma or less, 75% of those have good advancement opportunities	67,000 jobs can be ceated in Ohio	Effect of $150 billion investment in renewable energy on the total economy and how it would benefit low income workers.	Linear economic calculation based on data from US Department of Commerce	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	Impact on the Economy of the American Clean Energy and Seucrity Act of 2009 (HR 2454) (August 2009)	National Black Chamber of Commerce	CRA International	American Clean Energy and Seucrity Act of 2009, HR 2454	GDP growth averaging 2.6 percent a year by 2050; opportunity cost to consumers	This study predicts that employment gain in the midwestern region will be dampened by 310,000 jobs by 2030.	Takes into account carbon cap and trade, RES, some technology items (CCS), assumes all revnues not programmed are returned to consumer;	MRN-NEEM; MS-MRT with extensive electric power sector detail; provides three scenarios. Reference case based on AEO early release 2009	$2,008	Low Scenario - (.5%) High Scenario -(1.8%)	Low - 27 High - 56	Low Scenario - $650 High - $1710	Low - (.7%) High - (2.3%)	Low - $44 High - $91	Low - $690 High $1850	Low - (1.0%) High - (3.1%)	Low - 117 High 241	Low - $810 High $2150
10	Energy Markets and Economic Impact of HR2454, "The American Clean Energy and Seucrity Act of 2009" (August 2009)	Energy Information Administration (EIA)	Same	American Clean Energy and Security Act of 2009, HR 2454	Average household income will rise by $11,117 annually between 2009 and 2030. Average opportunity cost of $142 per household in 2020, undiscounted, 2005 $$; discounted and parsed by scenario, this ranges from $59 to $292 (2007$$)	N/A	Cap & trade, allocation of allowances, the combined renewable energy & efficiency standard, CCS & energy efficiency standrds , technology improvements and smart grid programs.	National Energy Modeling System (NEMS)- Macroeconomic Analysis Module (MAM)(Based on HIS Global Insights US Model)	Discount rate of 4%; $2007	Low Scenario - (.3%) High Scenario -(.7%)	Low - 20 High - 93 Basic - 32	Low Scenario - $30 High Scenario $362 undiscounted - over lifetime of program discounted NPV (2007$) is $83 to $292	Low - (.8%) High - (2.3%)	Low - 41 High - 191 Basic - 65	Low - $339 High - $850	N/A	N/A	N/A
11	EPA Analysis of the American Clean Energy and Security Act of 2009 HR 2454 In the 111 Congress June 23, 2009	United States Environmental Protection Agency (EPA)	Same	American Clean Energy and Security Act of 2009, HR 2454	Households see income rise $7,400 to 11,400 on the average by 2030. Average discounted household opportunity cost(household consumption) of $80 to $111.	N/A	The analysis focuses on the economy wide cap & trade program, the energy efficiency provisions, and the competitiveness provisions.	Applied Dynamic Analysis of the Globall Economy(ADAGE) and Inter-temporal General Equilibrium Model (IGEM); based on AEO March 2009 without ARRA provisions)	Discount rate of 5%	Low Senario - (0.10%) High Scenario - (.11%)	2015 Low - $13 High - $13	Low scenario - $49 High Scenario, $61 (NPV)	Low - (0.30%) High - (0.31%)	Low - $26 High - $27	Low - $99 High - $132	Low - (0.76%) High - (0.78%)	Low - $76 High - $77	Low - $123 High - $174
12	The Economic Effects of Legislation to Reduce Greenhouse- Gas Emissions (September 2009)	Congressional Budget Office (CBO)	Same	American Clean Energy and Security Act of 2009, HR 2454	Limits future growth GDP of 250% by 2050 years by roughly ¼ to ¾ percent in 2020 and between 1 and 3½ percent in 2050; long-run opportunity cost to households estaimated to be $175 in 2020. Progressive impact by income quintile.	N/A	Cost of mitigated cap and trade (revenues raised and redistributed through allowances)	Cost and benefit estimates derived from a review of Other models, including EPA, EIA, MIT, CRA, Brookings and	Measured in $2010 $$	Low Scenario - (.02%) High Scenario - (0.7%)	$23	Lowest quintile - -+$125 Fourth Quintile ($375) Average - ($161)	Low - (0.4%) High - (1.1%)	$40	N/A	Low - (1.1%) High - (3.4%)	$118	Lowest quintile -+$155 Fifth Quintile - ($1,365) Average - ($925)

NOTES:

1. Opportunity Cost refers to the limits on projected growth attributed, in the econometric modeling, to the carbon cap and trade program.
2. Low cost scenario refers to an analysis that provides yields the least impact on the economy; high cost scenario is the opposite.
3. GDP stands for Gross Domestic Product
4. BAU stands for 'Business as Usual'
5. Allowances means emissions allowancs - the price the market sets under the cap and trade program per ton of greenhouse gas emitted ito the sky.