

## Michigan Economic Impact on the State from the Waxman-Markey Bill, H.R. 2454 Proposed Legislation to Reduce Greenhouse Gas Emissions

This study analyzes the Waxman-Markey bill under low and high cost cases with respect to a baseline that projects the future in the absence of the bill.<sup>1,2</sup> W/M sets targets that would reduce GHG emissions to 17% below 2005 levels by 2020; 42% below 2005 levels by 2030; and 83% below 2005 levels by 2050 (Figure 1). The price of carbon permits (what companies must pay to emit CO<sub>2</sub>) could reach between \$48 and \$61 per metric ton of CO<sub>2</sub> (MT) by 2020 and could increase to between \$123/MT and \$159/MT by 2030.<sup>3</sup>

### Impact on Jobs

The jobs impact of W/M is delayed by the free allocation of permits and generous carbon offsets. By 2030, as emission reduction targets tighten and other W/M provisions phase out, Michigan jobs decline by 66,600 under the low cost case and 90,800 under the high cost case (Figure 2). The primary cause of job losses is lower industrial output due to higher energy prices, the high cost of complying with required emissions cuts, and greater competition from overseas manufacturers with lower energy costs.

### Decrease in Disposable Household Income

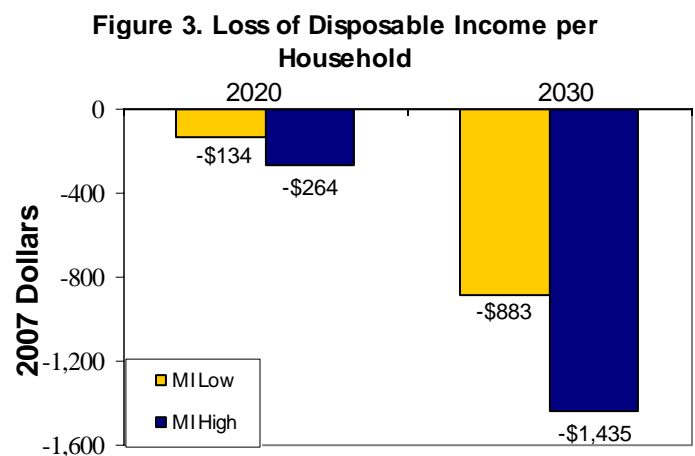
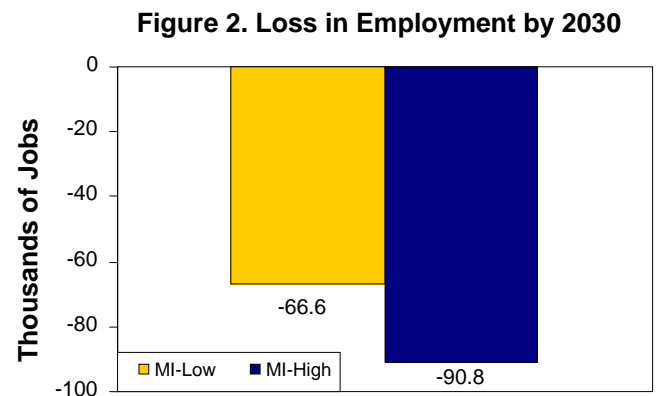
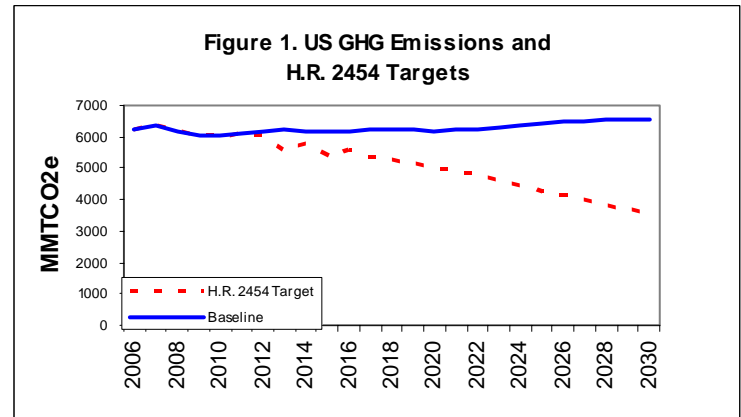
Higher energy prices would have ripple impacts on prices throughout the economy and would impose a financial cost on households. Michigan would see disposable household income reduced by \$134 to \$264 per year by 2020 and \$883 to \$1,435 by 2030 (Figure 3).

### W/M's Impact on Energy Prices

Most energy prices would rise under W/M, particularly coal, oil and natural gas. By 2015, gasoline would increase between 6% and 8%, electricity between 2% and 5% and natural gas between 17% and 26%. By 2030, gasoline prices increase between 20% and 26% while electricity prices increase by up to 60% and natural gas by up to 79%. Table 1 shows the increase in energy prices faced by a typical Michigan household compared to national household increases over the 2020-2030 period.

### Factors Contributing to Higher Electricity Prices

W/M would reduce GHG emissions from all sectors of the economy (transportation, residential, commercial, and industry); however, as the largest emitter of GHGs, the primary impact would fall on the electric sector. W/M would result in the electric industry shutting down most carbon-based generation and/or using expensive, as yet unproven technology, to capture and store CO<sub>2</sub>. To meet the stringent goals of W/M, the electric industry would also have to substitute high cost technologies, such as biomass and wind, for conventional generation.



<sup>1</sup>The study used NEMS/ACCF-NAM 2, the version of the National Energy Modeling System (NEMS) used in this project, and assumptions provided by ACCF and NAM for this analysis. It was performed independent of EIA which uses the NEMS model for energy forecasting and policy analysis. (See the full report for all assumptions).

## Impact on Economic Growth

High energy prices, fewer jobs, and loss of industrial output are estimated to reduce Michigan's gross state product (GSP) by between \$1.1 and \$1.9 billion per year by 2020 and \$12.1 and \$16.5 billion by 2030 (Figure 4).

## Impact on Industry

Michigan's major economic sectors will be affected by emission caps (Figure 5).<sup>4</sup> The current two largest sectors, chemical manufacturing and transportation manufacturing, show decreases in output of 6.1% to 6.7% and 8.0% to 8.5%, respectively in 2030. All manufacturing sectors will suffer output losses of between 5.4% and 6.0% by 2030, while output from energy intensive sectors falls between 10.7% and 11.7%. Michigan's electricity production would fall between 15.1% and 18.6% (Figure 6). These continued losses will have a lasting effect on the economic base of Michigan.

## Impact on Low Income Families<sup>5</sup>

The impacts of W/M will be felt especially by the poor, who spend a greater share of their income on energy and other goods than other income brackets. By 2030, higher energy prices mean that low income families in Michigan (with average incomes of \$13,881) will spend between 19.1% and 20.2% of their income on energy under W/M compared to a projected 16.1% without W/M. Others on fixed incomes such as the elderly will also suffer disproportionately.

## Impact on State Budgets<sup>6</sup>

The increases in Michigan's energy costs under W/M will impact expenditures throughout the state. Specifically, Michigan's 5,178 schools and universities and 187 hospitals will likely experience a 28.2% to 42.0% increase in energy expenditures by 2030. For government entities, costs for services, including public transportation and vehicle fleets, such as school buses, will also rise under W/M.

Sector	Year	Michigan		US	
		Low	High	Low	High
Electricity (Residential)	2020	0.9%	5.2%	5.0%	7.9%
	2025	-1.3%	-1.6%	4.9%	11.5%
	2030	37.5%	59.7%	31.4%	50.0%
Gasoline	2020	8.4%	11.3%	8.3%	11.1%
	2025	12.0%	15.9%	12.0%	16.0%
	2030	19.9%	26.1%	20.0%	26.1%
Natural Gas (Residential)	2020	-3.5%	0.3%	-3.3%	0.1%
	2025	5.3%	11.1%	4.8%	10.1%
	2030	60.6%	78.8%	56.3%	73.5%

Figure 4. Loss in Gross State Product For Michigan

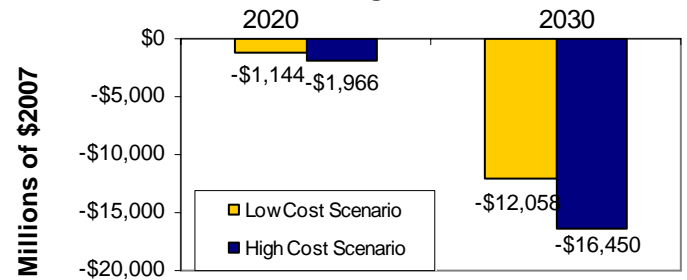


Figure 5. Percent Change in Output by Industry in 2030

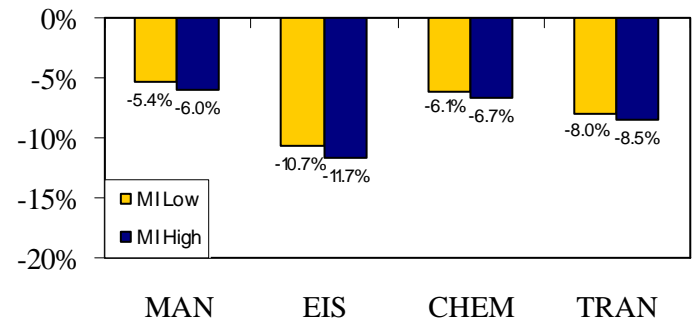
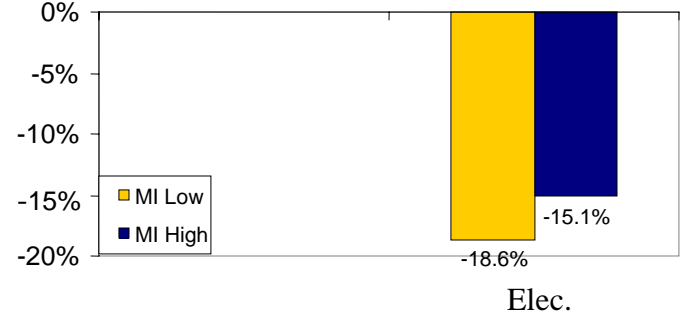


Figure 6. Percent Change in Production by Sector in 2030



<sup>2</sup>“Low” refers to the Low Cost Case, which assumes higher nuclear capacity, fewer constraints on new generating technologies, etc. “High” refers to the High Cost Case, which assumes low nuclear additions and constrained new generation technologies, etc. (See the full report for all assumptions).

<sup>3</sup>All dollar figures in this report are presented in constant 2007 dollars.

<sup>4</sup>MAN = manufacturing industries, EIS = energy intensive industries; CHEM = chemical manufacturing; TRAN = transportation manufacturing.

<sup>5</sup>These projections assume that the energy expenditures by income quintile in the state are the same as the average for the census division, since there is insufficient data to accurately calculate this quantity on the state level.

<sup>6</sup>These projections assume that the expenditures on schools and hospitals are the same as the average for the census region, since there is insufficient data to accurately calculate these quantities on the state level.