

EFFECTS OF GLOBAL WARMING ON THE STATE OF MICHIGAN

GLOBAL WARMING WILL HURT MICHIGAN

The vast majority of the world's leading scientists now agree that human activities may lead to substantial impacts on the global climate. Consensus estimates warn of an average increase in temperatures of between 2 and 10 degrees Celsius over the next century, leading to more severe drought, rising sea levels, shifting seasons, and increased cases of disease.

In Michigan, this could lead to a number of problems. Projections show temperature increases of about 4 degrees year-round. These higher temperatures and more frequent heat waves could increase heat-related deaths and illnesses from insect-borne diseases like malaria and West Nile virus, which was detected in over half of Michigan's counties in 2003, with 19 human cases reported. Increased temperatures would make the state more habitable for mosquitoes that carry the virus, likely leading to increased human infections.

IMPACTS ON MICHIGAN

- More frequent heat waves
- Increased illness from insect-borne diseases
- Negative impacts on farm production and fish population
- Increased need for irrigation systems

A temperature increase in this range would bring average summer temperatures in Detroit up to levels felt in Richmond, Virginia, and could double heat-related deaths. With substantial agricultural resources, Michigan is particularly sensitive to variations in the weather. Higher summer soil temperatures would increase evaporation rates, creating potentially large reductions in corn yields and the need for large investments in irrigation systems, which are currently rare in the state. Shorter periods of ice coverage and increased evaporation rates could lower water levels in the Great Lakes and shipping channels by a foot or more, hampering shipping to and from the state. Warmer temperatures would also reduce dissolved oxygen levels in lakes, and cold water habitats for local fish populations could shrink or disappear altogether.

THE "CLIMATE STEWARDSHIP ACT"

The Climate Stewardship Act (CSA), introduced in the Senate by Senators McCain and Lieberman, and in the House by Representatives Gilchrest and Olver, is based on a similar and highly successful program implemented by the Clean Air Act that has led to large reductions in acid rain-causing pollution with a minimum of economic costs. CSA would create a market-based cap-and-trade system to reduce emissions of carbon dioxide (CO₂) and other heat-trapping gases from electricity generators and other large industrial and commercial sources, covering 85% of the nation's emissions.

Under a cap-and-trade system, a fixed number of emissions allowances (permits) are distributed to emitters. One permit allows the holder to emit one metric ton of CO₂ or an equivalent amount of other gases. Companies that can run their business without using all their al-

lowances can sell their surplus to companies whose actual emissions exceed their allowances. Under such a system, emissions are reduced by those who can do so at the lowest cost, thus minimizing economic impacts. Cap-and-trade systems make reducing pollution a potential source of profit for companies, giving them an incentive to devise new and even cheaper ways to cut their emissions.

Beginning in 2010, the CSA would cap emissions at their 2000 levels. To help meet this target, the Act contains various flexible mechanisms allowing companies to meet their reduction targets through a variety of ways, including investments in clean energy projects outside the U.S., international trading of emission credits and by storing carbon in trees and the soil.

ECONOMIC IMPACTS

Estimates show that the benefits of CSA would outweigh its costs by a ratio approaching 2:1. While the Act's provisions would impose about \$150 billion (net present value) in emissions reduction costs nationwide, it would generate \$250 billion worth of benefits in the form of increased energy efficiency, reduced energy expenditures and economic growth through 2025. Nationwide, the Act would create over 500,000 jobs by 2015. Our analysis of the job impacts is based on research from the Tellus Institute, a nonprofit research and consulting organization, which studied the effect of the Act's cap-and-trade program as well as energy efficiency and other technology incentive programs that would be funded through the Act.

Like the nation as a whole, our analysis shows that the net impact of the Act on jobs in Michigan is also positive. By 2015, more than 18,900 new jobs would be created over a business-as-usual approach, growing to almost 31,000 new jobs by 2025.

The gains would be spread throughout the state's economy,

CLIMATE STEWARDSHIP ACT

- Cap and Trade
- Similar program reduced acid rain by 50% at 1/10 the estimated cost
- Lowest cost solution
- Protects rural electric co-ops

COST-EFFECTIVE FOR THE UNITED STATES

- \$250 billion benefits at cost of \$150 billion
- 500,000 new jobs by 2015

and while the utility sector could suffer some job losses statewide, these would be more than offset elsewhere through growth in construction, metals and other industries. In addition, Michigan has substantial wind energy resources, ranking 14th in the nation. Wind potential is estimated to be over 65 billion kilowatt hours a year, or about 62% of electricity used in the state in 2000. The vast majority of this potential remains untapped, and further developing the state's wind resources could generate substantial economic benefits, not only for the energy sector but also for farmers and ranchers who stand to gain by leasing parts of their land to wind generators. Given Michigan's potential for wind power projects and the state's well-established manufacturing and metals industries, the state could also see an upsurge in the manufacturing sector to supply the necessary machinery and other components, not only for use within the state, but also for export to other states, as the Act would spur additional demand for wind power equipment nationwide.

IMPACTS ON MICHIGAN

- Net increase of 18,900 jobs by 2015
- Increased demand for agricultural products for bio-energy
- Fostering local production of wind power components
- Dairy farms benefit by converting waste to energy & emission reduction credits

Michigan also stands to gain from the increased use of corn-based ethanol, and, in the long run, from cellulosic ethanol made from agricultural wastes and dedicated energy crops. Additionally, dairy farms, which account for about 25% of Michigan farm income, could benefit as well by using anaerobic digesters to handle their livestock waste. Digesters can convert the waste to bio-gas which can be used to produce steam or electric energy for use on the farm or sold to others. At the same time, by reducing their methane emissions, farmers could sell emission reductions in the trading market created by the CSA.

Nationally, not all sectors of the economy would benefit. Reducing CO₂ and other emissions would require reduced use of fossil fuels, leading to economic contraction in those sectors. Increasing energy efficiency, while providing substantial benefits to both residential and commercial energy consumers, leads to reduced demand for electricity, posing some costs on that sector as well. Overall, however, these costs are more than offset by gains in other sectors, like construction, which would see a substantial increase in demand for new projects spurred by the increased implementation of energy-efficient and renewable energy technologies. The manufacturing sector would also see increased employment with increased demand for energy-efficient equipment.

Michigan's consumers stand to benefit from the Act as well. The energy efficiency provisions included in the Act will generate substantial savings in the form of reduced energy

expenditures. While energy prices will increase moderately as a result of the pollution reduction requirements in the Act, these costs will be offset by reduced consumption and rebates of revenue raised by allowance sales. Energy savings for households and businesses will free up substantial resources that can be reinvested in state and local economies.

There are other non-economic benefits as well. Michigan's major cities currently face air quality problems, and have been classified as "non-attainment areas" for ground-level ozone. Increased temperatures will exacerbate this problem. In addition, about two-thirds of the electricity generated in the state comes from coal fired power plants. Coal-fired power plants emit fine particles, which trigger respiratory illnesses and increased mortality rates, and sulfur dioxide and nitrogen oxides, both of which are known precursors of acid rain, which can damage forests, water and wildlife. Coal-fired power is also a substantial source of mercury, a known human neurotoxin which can enter the human food chain through fish populations. By reducing Michigan's reliance on coal, the Act can help reduce these problems.

OTHER BENEFITS

- Consumers save through energy efficiency improvements
- Wind energy could produce 65 billion kilowatt hours/year

DON'T UNDERESTIMATE ENTREPRENEURIAL INNOVATION

As the CSA is debated, a handful of naysayers will undoubtedly claim that doing anything to reduce global warming pollution will be economically disastrous. A close look at these dire predictions will reveal that they have little merit. For example, one is based on a six-year-old study of the Kyoto Protocol, a substantially different proposal than the CSA.

Studies predicting economic disaster from environmental protection invariably underestimate the ability of American businesses to innovate to solve new problems. When the Clean Air Act Amendments were debated in 1990, industry lobbyists predicted that the law would turn America into a third rate economic power. Not only have businesses survived the Clean Air Act, but we have thrived. Climate change is a problem that needs to be addressed. Our leaders need to have confidence in our ability to innovate.

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