



# FACTS OHIO

A M E R I C A N S E C U R I T Y P R O J E C T

## Pay Now, Pay Later: Ohio

Since 1997, warmer than usual temperatures have led to a 3.5-foot drop in Lake Erie's water levels, compromising the profitability of Ohio's manufacturing and shipping industries.<sup>1</sup>

If shipping activity in Ohio decreases each year by 2% due to increasingly limited transportation capacity, within a 10-year period almost 49,000 jobs would be at risk.<sup>2</sup>

Between 1998 and 2007, Ohio enjoyed a 7.3% job growth rate in the clean energy economy, but experienced a 2.2% decline overall.<sup>3</sup>

According to a new study, a failure to mitigate the effects of climate change could begin to cause serious gross domestic product and job losses within the next several decades. Between 2010 and 2050, it could cost Ohio \$26.7 billion in GDP and nearly 168,000 jobs.\*

*\*GDP numbers are based on a 0% discount rate. Job losses are measured in labor years, or entire years of fulltime employment. Backus, George et al., "Assessing the Near-Term Risk of Climate Uncertainty: Interdependencies among the U.S. States," Sandia Report (Sandia National Laboratories, May 2010), 141. [https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate\\_Risk\\_Assessment.pdf](https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate_Risk_Assessment.pdf) (accessed March 23, 2011).*

Admittedly, the effects of climate change, a complex and intricate phenomenon, are difficult to predict with precision. Informed scientific and economic projections, as we have used in our research, however, allow us to see that Ohio faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows Ohioans are in a position to benefit from the research, development, and use of renewable energy technologies. As the 4<sup>th</sup> largest emitter of carbon dioxide in the United States, the challenge of decreasing greenhouse gases will be as substantial as it is necessary.<sup>4</sup> Fortunately, Ohio has vast biomass energy potential—over 19 million tons available annually—which can be used to provide substantial amounts of electricity (3,800 MW). Additionally, Ohio is poised to benefit from the manufacturing of wind turbines. The state could gain over 11,500 jobs and \$3.9 billion in investment in

this industry alone should a national standard be implemented.<sup>5</sup> Should we fail to take action, Ohio has much to lose.

## Pay Later: The Cost of Inaction

**The most recurrent and costly natural disaster in Ohio is flooding, which saddled the state with \$572 million in emergency costs during the 1990s.** Homeowners in Ohio spend upwards of \$27 million annually on flood insurance.<sup>6</sup> If nothing is done to reduce emissions, scientists project that Cincinnati will experience a 30% increase in heavy rainfall (more than two inches of rain in a single day) by 2040. This will lead to an upsurge in events such as the August 2007 flood emergency that forced the evacuation of more than 500 families.<sup>7</sup> The paradox is

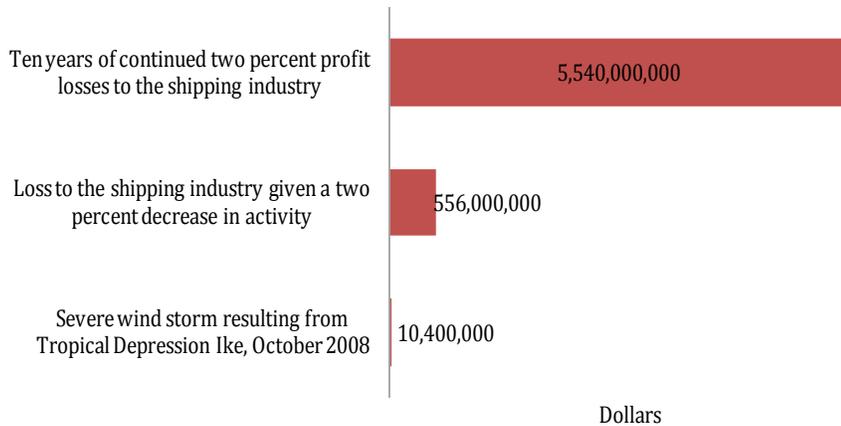
that although Ohio can expect to experience more extreme rainfall and flooding, there are projections for more short-term droughts that will have significant impacts on the agricultural, commercial shipping, and tourism industries.

## An Agrarian History under Threat

Ohio is ranked 8<sup>th</sup> in the nation for corn production and represents a significant portion of agricultural output; in 2007, corn accounted for \$1.5 billion of the \$7 billion agriculture contributed to the state economy. Consistently rising temperatures, upwards of 92°F, will have a profound effect on the economy. **In 2002, the warmest summer in the last 50 years caused the loss of one-third of the state's average corn yield.**<sup>8</sup> More protracted periods of drought will damage Ohio's agricultural industry by reducing crop yields, endangering livestock, and providing ideal circumstances for pests to proliferate. Farmers have become familiar with the economic impact of dry spells, and in 1999 saw income losses of 11% to match the reduction in corn yield.<sup>9</sup>

Increased drought will also have a detrimental impact on the dairy industry, ranked 11<sup>th</sup> in the nation and valued at \$860 million in 2007.<sup>10</sup>

## Costs to Ohio's Economy



Sources: *Center for Integrative Environmental Research, University of Maryland; Federal Emergency Management Agency*<sup>17</sup>

In 2004, cattle and dairy production represented half of Ohio's \$2.2 billion livestock sector and 28% of agricultural income.<sup>11</sup> However, milk production can begin to decline at temperatures exceeding 75°F.<sup>12</sup> Ohio's 267,000 dairy cows produce an average of 600 million gallons of milk every year, but increasingly hot summers will diminish their capacity to meet the demands of the national dairy industry.<sup>13</sup> Studies have shown that under circumstances of prolonged heat stress, individual cows could decrease production by more than 80 gallons of milk per year.<sup>14</sup>

Furthermore, flooding will trigger vast soil erosion throughout the state (most severely in northwestern Ohio), which will affect the state's agricultural industry. By some estimates, climate change will result in farmers' inability to grow wheat crops in western Ohio in the next 30-50 years.<sup>15</sup>

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## A Transportation Nightmare

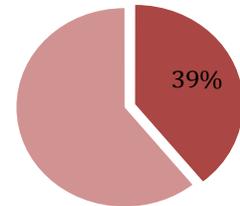
**The ability to import and export raw materials and goods is essential to Ohio's manufacturing and shipping industries, which exported \$18.8 billion in goods to Canada in 2006.**

However, the costs of unmitigated climate change will be disastrous for the shipping industry as Lake Erie's water levels are projected to evaporate 34 inches in the next 60 years, shrinking the surface area by 15%. As water levels recede, carriers will have a reduced capacity that will cost \$30,000 per ship. A mere 2% drop in shipping activity would yield a profound economic impact—particularly over a 10-year period.<sup>16</sup>

Ohio's travel and tourism industry employed over 577,000 people in 2008, and generated over \$14.5 billion in 2008 accounting for 8% of its gross state product.<sup>18</sup> Fishing, recreation, tourism, and water purification industries centered around Lake Erie alone are worth \$10 billion. In combination with other climate change effects, water evaporation over the next 70 years could reduce Lake Erie's depth by 3-6.5 feet and significantly alter life and business for people living and working nearby.<sup>19</sup>

In 2009, nearly 30% of Ohioans employed in the nonagricultural sectors were involved in manufacturing, trade, transportation, warehousing, hospitality, and leisure sectors, all of which are projected to be among the most directly affected.<sup>20</sup>

## Ohioan Labor Force Projected to be Directly Affected



Source: *Bureau of Economic Analysis*<sup>21</sup>

## Deteriorating Health in Ohio

**Asthma attacks account for nearly 44% of all emergency room visits in children under the age of 19, costing families both time and money.**<sup>22</sup>

Although the national average of asthma sufferers in the United States is approximately 7%, asthma attacks account for nearly 25% of emergency room visits each year.<sup>23</sup> More than 9% of Ohio's population suffer from asthma, which has affected the quality of life of children and the elderly.<sup>24</sup> This is less surprising considering Ohio is the 6<sup>th</sup> highest energy consuming state in the country, and is overwhelmingly reliant upon coal, which generates 88% of the state's electricity.<sup>25</sup> This dependence on coal has had a significant effect on air quality in the state in the form of small particulate pollution.<sup>26</sup>

If nothing is done to combat the effects of climate change through reform of the energy industry, chronic health issues such as heart disease,

bronchitis, and emphysema will persist. Pollution from power plants led to a 2005 decision to close one school in a Cincinnati suburb where the chemical levels were so high that the Ohio Environmental Protection Agency found the risk of cancer related to pollution to be 50 times greater than state regulations allow.<sup>27</sup> More comprehensive investigations are needed to determine the significance of power plant pollution on development and health throughout Ohio.

## Pay Now: The Benefits of Taking Action

**The facts in Ohio are clear: overall job growth from 1998-2007 was down by 2.2% and 279,000 jobs were lost from 2008-2009 alone. By contrast, clean job growth during the former period increased by 7.3%.<sup>28</sup>** A healthy and sustainable future for Ohio depends on transitioning to more environmentally conscious practices. Fortunately for the state, it is rich in the necessary renewable fuels and the industrial sector labor force.

Studies have further shown that homeowners in Ohio would save \$9.85 a month in electricity bills by 2020 if the American Clean Energy and Security Act had been enacted<sup>29</sup>—an estimated 10% savings to average residential electric bills of almost \$72 a month in 2005.<sup>30</sup>

In 2007, Ohio's clean energy economy was categorized as "large and growing" by the Pew Research Center, exceeding the national average for green job growth. Venture capital investment in clean energy in Ohio approached \$75 million between 2006 and 2008.<sup>31</sup> However, Ohio has been hit particularly hard by the economic recession, with unemployment rates significantly higher than the national average of 9.7%. Unemployment in Ohio rose to 10.9% in February 2010 as more people entered the job market but were unable to find jobs. Reports have noted that job losses were most abundant in goods-producing industries.<sup>32</sup> A recent study by the Political Economy Research Institute analyzed the types of occupations that could benefit from six types of green investment: "building retrofitting, mass transit, energy-efficient automobiles, wind power, solar power, and cellulosic biomass fuels." By investing in the economy and working to halt the effects of climate change, Ohio could reinvigorate the job growth and retention that has been stalled in recent years. Helping the United States expand its burgeoning green industry and energy sector would provide new employment opportunities to build wind turbines, install and maintain solar panels, and manufacture and transport tools and parts.<sup>33</sup> The skills of approximately Ohio's 25,000 machinists, for example, would be necessary for building retrofitting, mass transit work, and solar power production in a green economy.<sup>34</sup>



Major Electric Power Plants (>100 MW)		Renewable Energy Potential
▲ Coal	● Geothermal	■ Biomass (>= 50 tons/sq km/yr)
◆ Hydroelectric	▼ Natural Gas	▨ Geothermal (>= 80 milliwatts/m2)
● Nuclear	● Petroleum	■ Solar (>= 6.0 kWh/m2/day)
● Solar	✕ Wind	▨ Wind (>= 3 Power Class)
● Wood	● Other Renewable	

## Conclusion

Ohio must consider action on climate change not just in terms of cost, but also in terms of opportunities. If we give Ohio's population, businesses, and investors clear and consistent signals by offering initiatives and cultivating demand, investment and innovation in renewable technologies will follow.

**Ohioans will have to pay for the effects of climate change.** The question is whether they will pay now or pay later and run the risk of paying a much higher price.

(Endnotes)

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