



FACTS DELAWARE

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: Delaware

Damaged coastal areas and ecosystems due to unabated climate change could harm the tourism industry. In 2006, total tourism expenditures in Delaware amounted to \$3.19 billion.¹

Delaware's 2,500+ farms could face losses as a result of heat stress, droughts, and agricultural pests.²

Investments in clean energy could create almost 6,000 jobs for Delawareans³—particularly significant in the current economic climate.⁴

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 Delaware \$4.8 billion in GDP and over 30,300 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 (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 Delaware faces significant losses in industries crucial to its economy if no action is taken to combat the effects of global warming.

Moreover, data shows Delaware is poised to benefit from research, development, and distribution of renewable energy technologies. The American Wind Energy Association estimates Delaware's future wind potential to be 197 MW of capacity,⁵ and the company contracted to do the work alleges it can power nearly a third of Delaware's homes.⁶ Should we fail to take action against climate change, Delawareans have much to lose.

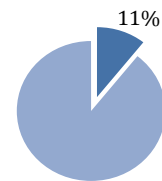
Pay Later: The Cost of Inaction

Coastal areas in Delaware will experience an increased frequency and force of storm-related flooding and coastal erosion over the next century as a response of sea level rise. Increased shore erosion can further exacerbate flood damages by removing protective dunes, beaches, and wetlands, thereby exposing formerly protected properties to the water's edge.⁷ Sea level rise is already submerging Delaware's wetlands, according to a 2002 study by University of Maryland scientists. By 2100, many of the Delaware Bay's coastal marshes could disappear.⁸

A Coastal State Under Water

According to the National Oceanic and Atmospheric Administration, Delaware is categorized as an

Delaware's Labor Force Projected to be Directly Affected



Sources: Bureau of Labor Statistics; Global Insight⁹

entirely coastal state, potentially placing the livelihoods and lifestyles of all Delawareans and state visitors in the path of an already rising sea level.¹⁰ Both economically and culturally, the Delaware coast is one of the state's most valuable assets; its 381 miles of shoreline welcome thousands of beach-goers, boaters and fishermen—just to name a few.¹¹

In 2006, the net economic contribution of travel and tourism in the First State was \$1.8 billion.¹²

Tourism is the state's 5th largest private sector employer:¹³ nearly one of every 12 private sector employees in Delaware owes their job to the tourism sector—expanded to include indirect employment resulting from Delaware's booming tourist industry, this number grows to roughly one in 10.¹⁴ Climate-induced losses to these crucial industries pose a serious economic risk to Delaware and its citizens.

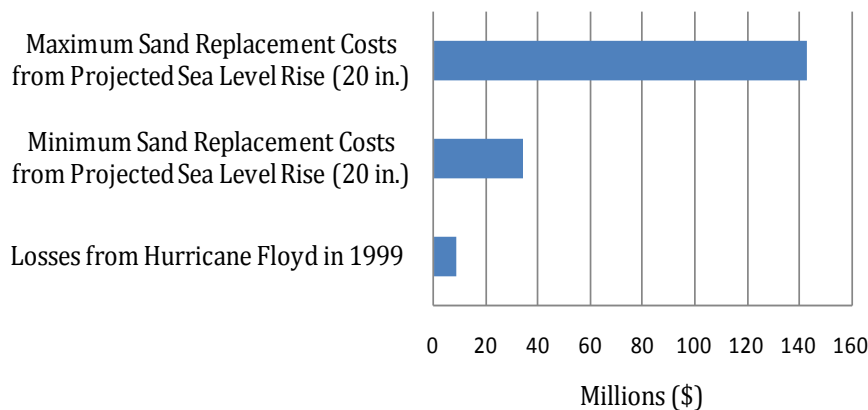
The wildlife-related industries are an important contributor to the tourism industry. **Over 486,000 anglers, hunters, and wildlife viewers visited Delaware in 2006, spending over \$283 million.**¹⁵ The Delaware Bay's wetlands are home to roughly 35% of its estuary's rare species. Additionally, 70-90% of the state's fish and shell-

30 feet per year from 1968-1981—it now no longer exists.¹⁹ As the sea level rises and storms become increasingly prevalent and damaging, Delaware's beloved shoreline will continue to succumb to erosion. The majority of the state's coastline is comprised of especially vulnerable sandy beaches and tidal wetlands, which are in a

Since agricultural production is directly linked to climate and water supply, Delaware's farmers will face growing uncertainty and risk as they are forced to adapt to changes in the region's climate. The effects of change on the state's agricultural economy will be one of boom or bust, causing major crop yields to decline by as much as 32%, or rise by as much as 24%.²⁴ A longer, warmer growing season could allow for greater crop yields—especially in the near-term, but several negative impacts from climate change could inhibit this—summer heat stress, drought, and increased pest-related damage to name a few.²⁵

In 2008, drought conditions led to an estimated two-thirds of Delaware's farmers sustaining losses greater than 30% of their expected crop production; corn and soybeans were among the affected crops.²⁶

Costs Associated with Effects of Climate Change Compared with Hurricane Losses



Sources: National Wildlife Federation, Global Warming and Delaware; U.S. Geological Survey²²

fish sold commercially depend upon these habitats.¹⁶ As temperatures and sea levels rise, these habitats will be increasingly threatened and eroded.¹⁷ In Lewes, Delaware the sea level is 12 inches higher than it was 100 years ago, and some models predict waters will rise by as much as 23 inches by the end of this century. Nearly half of the wetlands in Delaware Bay—also a vital ecosystem for migratory shorebirds and horseshoe crabs—would be submerged given a 20 inch rise in sea level.¹⁸

Unfortunately, the marsh islands of Delaware's coastal bays are already being transformed by erosion. For example, Rehoboth Bay's Big Piney Island was subjected to erosion rates of

constant state of change as a result of erosion. Within the next few decades a greater portion of the open coast will experience significant physical changes.²⁰ An increased rate of erosion will also profoundly impact the residents of Delaware Bay—the nation's 6th most populated coastal watershed.²¹

Heat Stress Yields Less

Delaware's agricultural commodities contribute over \$1 billion annually to its gross state product; most profits come from poultry and poultry products. Broiler chickens brought over \$730 million in 2009, accounting for over 70% of the state's agricultural profits.²³

Pay Now: The Benefits of Taking Action

The clean energy industry in Delaware is growing faster than the state's overall economy. **In 2007, 211 businesses had generated more than 2,300 jobs for Delaware in the clean energy sector. Moreover, venture capitalists invested over \$3 million in the state's clean energy industry between 2006 and 2008.**²⁷

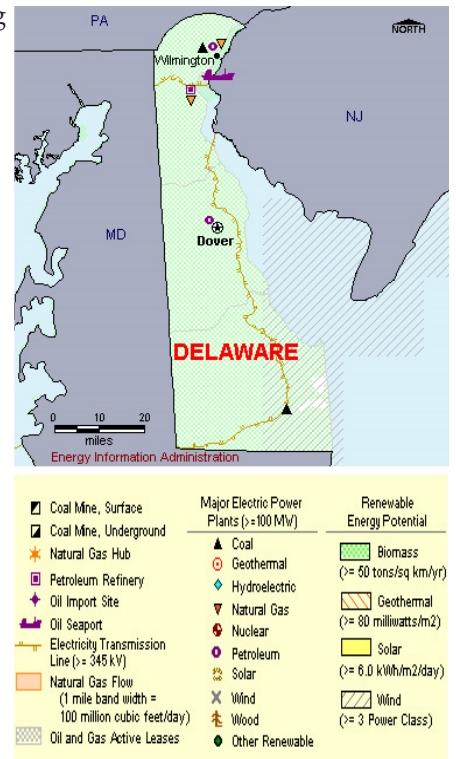
Delaware has already started to tap into its potential wind energy sources; in 2009, Bluewater Wind built a meteorological tower off the coast of Rehoboth Beach to map weather patterns in order to determine the best location for an offshore wind farm.²⁸ Delaware is also making great strides in solar energy research. The University of Delaware Solar Power Program is one of the leading solar

research centers in the country. The program has developed some of the most cutting edge solar energy capturing panels, increasing efficiency by nearly 43% above earlier systems.²⁹

Depending on the system installed, Delaware has the capacity to generate 3,500-5,000 watt-hours of solar power per square meter. **Through using just one square mile of solar panels, Delaware will be able to generate enough electricity for roughly 1,100 households each year.**³⁰

Laudably, Delaware is one of 10 Northeast states participating in the Regional Greenhouse Gas Initiative (RGGI). Those states enrolled in the program have pledged to cap and reduce the amount of carbon its power plants emit 10% by 2018.³¹ The 10 signatories hold allowance auctions four times each year and invest the earnings in energy efficiency and green jobs. Nearly 65% of the auction proceeds in Delaware (\$1.87 million) will be invested in the new Sustainable Energy Utility, an oversight board intended to design green and efficient energy programs for homeowners and businesses. Fifteen percent of proceeds will be benefit low-income consumers through state-run initiatives.³²

Delaware possesses the technical capability and resources to produce over 40% of its 2008 electricity needs from in-state, land-based renewable energy sources.³³ Delaware imported all the coal its power plants consumed in 2008 at a cost of over \$160 million.³⁴ It can reduce this dependence on imported coal by tapping its own wealth of renewable energy resources. Delaware has made a commitment to increase its renewable energy generation, passing a renewable portfolio standard, requiring utilities to use renewable resources to supply 20% of the state's power by 2019.³⁵ This is certainly important considering Delaware still has substantial untapped wind power potential from both onshore and offshore locations.³⁶



Conclusion

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

Delawareans will have to pay for the effects of climate change. The only remaining question is whether they will pay now, or pay later and run the risk of paying significantly more.

(Endnotes)

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