

# FACTS

## NORTH DAKOTA

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: North Dakota

A 2006 drought caused more than \$400 million in damages to crop production. Climate change will likely increase the frequency and intensity of such severe weather events.<sup>1</sup>

Climate change could reduce wetlands in the Prairie Pothole Region and some areas of the northern Great Plains by a drastic 91% before 2080, wiping out wildlife that supports the state's hunting and fishing industries.<sup>2</sup>

As a result of its unique geography and natural resources, North Dakota could potentially generate over 1.2 trillion kWh of electricity annually using wind resources alone—enough power for a quarter of the country.<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 North Dakota \$900 million in GDP and over 5,000 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, however, allow us to see that North Dakota faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows that North Dakota is in a position to benefit from the research, development, and use of renewable energy technologies. North Dakota has the highest wind production potential of any state in the country, yet is currently only the 11<sup>th</sup> largest wind energy producer.<sup>4</sup> Should we fail to take action against climate change, North Dakota has much to lose.

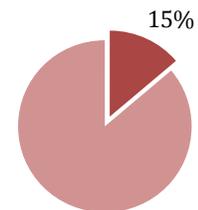
## Pay Later: The Costs of Inaction

North Dakota's economy is heavily tied to industries, such as agriculture, which are expected to suffer economic losses due to climate change. The state will also have to pay rising health-care costs, since higher emissions and pollution introduced into the air will increase the incidence of asthma and premature death—all which have a heavy human and economic cost.<sup>5</sup>

### Costs to Agriculture

**Agriculture is arguably North Dakota's most important industry—it generates 10.9% of its gross state product<sup>6</sup> and supports nearly 22,300 jobs.<sup>7</sup> Climate change will severely threaten this sector by increasing the**

## North Dakotan Labor Force Projected to be Directly Affected



Source: Bureau of Economic Analysis<sup>8</sup>

frequency of pestilence, drought, and other intense weather events. North Dakota is already subject to unpredictable weather patterns—including floods, tornadoes, droughts, and other severe weather—as well as resulting pest problems. **Pestilence and plant disease cost farmers over \$170 million in 2005 and resulted in overall state economic losses of nearly \$545 million.** A year later, the 2006 drought caused a loss of more than \$32 million to the livestock industry and \$425 million in damages to crop production.<sup>9</sup> Such events are predicted to increase in frequency and duration with climate change, inflicting greater losses on this vital industry.<sup>10</sup>

### Costs to Tourism, Recreation, Wildlife, and Related Industries

North Dakota is home to a rich variety of species that depend heavily on their habitats, particularly in the

wetlands—the state hosts the most productive waterfowl nesting areas in the country.

According to predictions, climate change could reduce wetlands in the Prairie Pothole Region and some areas of the northern Great Plains by a drastic 91% before 2080.<sup>11</sup>

Due to shifting environments, approximately 35 bird species are predicted to move their summer habitats out of North Dakota completely, while the populations of other species will shrink due to loss of the state's natural ecosystems.<sup>12</sup> The warmer weather also has the potential to reduce the number of ducks breeding in the region by up to 69% (under various climate scenarios), ultimately affecting the overall U.S. duck population, as North Dakota is one of the largest breeding grounds in the nation.<sup>13</sup>

All of these wildlife losses promise to have negative economic impacts as well. Almost 400,000 people spent \$260 million on hunting and fishing in North Dakota in 2006, while bird watching contributed another \$23 million to the economy. Hunting and fishing expenditures alone supported around 5,000 jobs in the state.<sup>14</sup> These currently thriving industries will all be threatened should climate change negatively affect North Dakota's wildlife.

### Health and Safety Costs

Currently, North Dakota receives nearly all of its electricity from coal-fired plants.<sup>15</sup> However, emissions and pollution from existing coal plants have negatively affected the health of

the state's citizens, causing an increase in asthma and premature death. In addition to the human costs of pollution, these emissions cost the state millions annually in health-related expenditures.<sup>16</sup> Continuing to burn coal will escalate costs. Renewable resources, as well as advanced clean coal technology, could help reduce the emissions that harm health and exacerbate climate change.

Changing weather conditions also raise other human security concerns and are likely to increase costs as well, particularly by causing infrastructure problems. For instance, climate change models predict more extreme weather events, such as heavy rains, to be mixed with periods of drought. However, extremely dry conditions decrease the soil's ability to absorb rainwater, resulting in increased runoff and potential flash flooding. **Flooding in 2004 destroyed 679 housing units, while flood damage to roads and other infrastructure cost the state \$2.35 million in 2002.** Some of the most recent flooding has been estimated to cost the Fargo-Moorhead region roughly \$196 million in economic damage.<sup>17</sup> Such an impact can have long lasting effects on the local economy.<sup>18</sup> Flooding events are expected to increase in frequency and intensity with climate change.<sup>19</sup>

## Pay Now: The Benefits of Taking Action

North Dakota's economy is likely to suffer significantly if it fails to mitigate the effects of climate change. Yet it also has great potential to benefit from the development of renewable energy resources.

North Dakota is ranked 1<sup>st</sup> among states in potential wind energy.<sup>20</sup> **With the potential to generate**



**over 1.2 trillion kWh of electricity annually, North Dakota could provide more than enough power for a quarter of the entire country.**

However, the state only had installed 714 MW of its wind energy capacity by the end of 2008, making it the 11<sup>th</sup> largest producer in the nation.<sup>21</sup>

In a positive move forward, North Dakota implemented a plan in March 2007 aiming to increase renewable energy generation to one-tenth of total electricity use by 2015.<sup>22</sup> However, North Dakota would benefit from further development of these resources. According to one study, a 20% renewable electricity standard by 2020 **could create 3,680 new jobs and attract \$617 million in capital investment while reducing electricity and natural gas bills by \$22 million.**<sup>23</sup>

# Conclusion

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

**North Dakotans 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.

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## (Endnotes)

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- 6 EconPost, *Agriculture Sector Top States by Percentage of State Economy*. <http://econpost.com/industry/agriculture-sector-top-states-percentage-state-economy> (accessed June 28, 2010).
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- 8 Includes Agriculture, Forestry, Fishing, Hunting and Tourism (arts/entertainment and accommodation food services) industries (2009). Bureau of Economic Analysis, *SA25N Total full-time and part-time employment by NAICS industry 1/ -- North Dakota*, March 23, 2011. <http://bea.gov/regional/spi/default.cfm?selTable=SA25N&selSeries=NAICS> (accessed April 13, 2011).
- 9 National Conference of State Legislatures, 1-2.
- 10 Ibid., 1.
- 11 National Conference of State Legislatures, 2.
- 12 Ibid., 3.
- 13 National Wildlife Federation, *Global Warming and North Dakota*, January 20, 2009, 1. <http://www.nwf.org/Global-Warming/-/media/PDFs/Global%20Warming/Global%20Warming%20State%20Fact%20Sheets/NorthDakota.ashx> (accessed June 28, 2010).
- 14 National Conference of State Legislatures, 2-3.
- 15 U.S. Energy Information Agency, *North Dakota*, June 24, 2010. [http://tonto.eia.doe.gov/state/state\\_energy\\_profiles.cfm?sid=ND](http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=ND) (accessed June 28, 2010).
- 16 See, for instance, Conrad G. Schneider, *Dirty Air, Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, *Clean Air Task Force*, June 2004. <http://www.catf.us/publications/view/24> (accessed August 10, 2010).
- 17 The Clear Skies Act of 2003 was a proposed bill to amend the Clean Air Act that would have required North Dakota to reduce emissions of SO<sub>2</sub> by 65%, NO<sub>x</sub> by 51%, and mercury by 44% by 2020. These reductions would have provided an estimated \$110 million in health benefits to the state. Source: Environmental Protection Agency.
- 18 Paul Quinlan, "WATER: Flood fears downstream hinder plans to divert Red River of the North," E&E Publishing, LLC, Augusts, 27, 2010). <http://www.eenews.net/public/Greenwire/2010/08/27/3> (accessed January 6, 2010).

- 19 Eric Snyder, "Floods of Foreshadowing," Portfolio.com, May 7, 2010. <http://www.portfolio.com/business-news/2010/05/07/nashville-leaders-look-to-other-recent-floods-to-gauge-next-steps-for-business-community-recovery/> (accessed January 6, 2010).
- 20 National Conference of State Legislatures, 2.
- 21 American Wind Energy Association, *Wind Energy: An Untapped Resource*. [http://www.awea.org/pubs/factsheets/Wind\\_Energy\\_An\\_Untapped\\_Resource.pdf](http://www.awea.org/pubs/factsheets/Wind_Energy_An_Untapped_Resource.pdf) (accessed June 28, 2010).
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