

FACTS KANSAS

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: Kansas

Climate change threatens to exact increasing, persistent costs on many aspects of Kansas' economy.¹

The quality and quantity of Kansas' water supply are likely to suffer from climate change, as is the health of many residents.²

Kansas has already begun to benefit from clean energy jobs, and has the potential to generate renewable electricity far in excess of its needs.³

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 Kansans \$6.3 billion in GDP and over 43,000 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 (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 Kansas faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows Kansas is poised to benefit from the research, development, and distribution of renewable energy technologies. Jobs in Kansas' clean energy economy grew by 51% from 1998-2007, compared with a decline in overall employment.⁴ And that is only scratching the surface: **Kansas has the capacity to produce 33 times its electrical needs through renewable sources**⁵—creating new jobs and improving residents' health. Should we fail to take action against climate change, Kansans have much to lose.

Pay Later: The Cost of Inaction

No state is more central to the nation than Kansas, the geographic center of the contiguous United States,⁶ "America's Bread Basket," and a lot of the "heart" in the Heartland. Just as the country of which it is emblematic, Kansas will experience the effects of climate change over the coming decades. Unlike the infrequent but potentially catastrophic risks that some coastal states face, such as hurricanes or coastal flooding, Kansas is likely to experience a relentless accumulation of smaller effects that may have a significant cumulative effect on the state's economy and water supply, as well as the personal health of Kansans.

Climate Change: A Real Drag

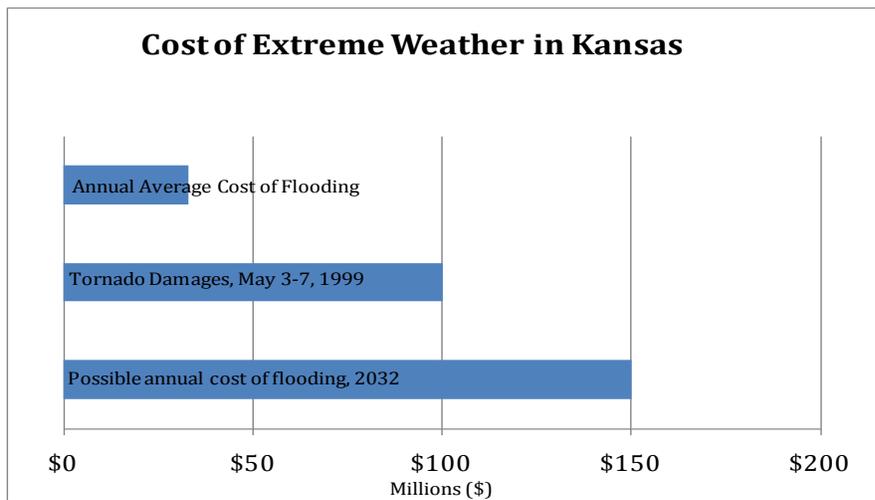
Although it may never experience an event like Hurricane Katrina, **Kansas will face hundreds of millions of dollars in annual losses to various industries and sectors** over the next several decades. While no single loss will be crippling, together they would create tremendous unwanted friction in Kansas' economic engine.

Kansas has the capacity to produce 33 times its electrical needs through renewable sources—creating new jobs and improving residents' health. Should we fail to take action against climate change, Kansans have much to lose.

Agriculture, hunting, fishing, and wildlife viewing contribute over \$15 billion to Kansas' economy, and are particularly vulnerable to climate change.⁷ Invasive species now cost Kansas about \$870 million per year in crop losses. **By 2017, a mere 1% increase in damage caused by invasive species each year could cost the state an additional \$58 million and 400 jobs in other economic sectors.**⁸ With a possible 9°F increase in temperature and 1% decrease in precipitation, western Kansas could see \$290

million in crop losses by 2035, with a rippling effect costing an additional \$169 million and 1,400 jobs elsewhere in the economy.⁹ **The hunting, fishing, and wildlife viewing industries generate \$643 million annually; a mere 1% drop in activity could cost the state over \$250 million in missed revenue by 2050.**¹⁰

Flooding now costs Kansas about \$33 million in damages each year. **By 2032, increased destructive flooding could cost the state nearly \$150 million and 700 jobs per year.**¹¹ Tornadoes currently cost Kansas about \$120 million per year,¹² and hail an additional \$46 million.¹³ If climate change increases that damage by just 1%, the increase could cumulatively cost the state an extra \$66 million by 2050.¹⁴



Sources: National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland; Insurance Services Office, Inc²⁵

different story: dry western Kansas will only get drier,¹⁷ while wetter eastern Kansas will likely see up to 11 extra inches of precipitation by 2100.¹⁸ The extra heat will possibly offset the extra precipitation, however, and cause an overall drying effect even in eastern Kansas.¹⁹ When it does come, precipitation is likely to be more intense,²⁰ and probably less welcome. In the west, it will cause flash flooding where the soil is, paradoxically, too dry to absorb water.²¹ In the wetter east—home to most of the people and livestock²²—it is likely to contaminate water supplies, making purification more expensive.²³ Irrigation will become more of a priority in the irrigation-heavy west, which relies on deep aquifers, and in the east, which relies more on surface water and groundwater.²⁴

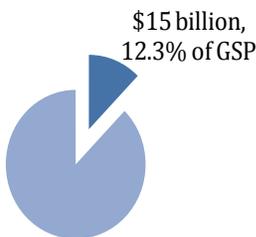
relic of the last ice age which has a rapidly dropping level and may be prohibitively expensive to pump from by 2020.²⁸ What that will mean for western Kansas is unclear, but it is worth noting that rising temperatures and drying soils helped fuel the Dust Bowl that devastated Kansas and other states in the 1930s.²⁹

Kansas burns coal to provide approximately three-quarters of its electricity needs.³⁰ Air pollution and rising temperatures contribute to ground level ozone, which exacerbates asthma and other respiratory diseases.³¹ **Asthma alone cost Kansas over \$220 million in 2004.**³² Unfortunately, rising temperatures and a dependence on coal creates a vicious circle: as temperatures rise and air quality suffers, air conditioner use increases, and coal-powered plants work overtime to supply electricity, increasing the amount of heat-trapping gases and ground level ozone,³³ continually escalating the problems.

Nor is ground-level ozone the only health risk. By 2060, a Kansas winter will mostly stay above freezing.³⁴ With long periods of heat and few hard freezes, pest-borne diseases might

The demand for water is predicted to increase by as much as 12.3% across the United States by 2050,²⁶ but Kansas would likely strain to meet such a level of increased demand. Warmer winters will reduce the spring runoffs that feed surface water and groundwater in the east.²⁷ The west is even worse off. Like many other areas in the grain-producing central states, it relies on the **Ogallala Aquifer, a**

Kansas GSP Projected to be Directly Affected



Sources: U.S. Energy Information Administration; National Wildlife Federation, Global Warming and Kansas¹⁵

Sinking Fortunes

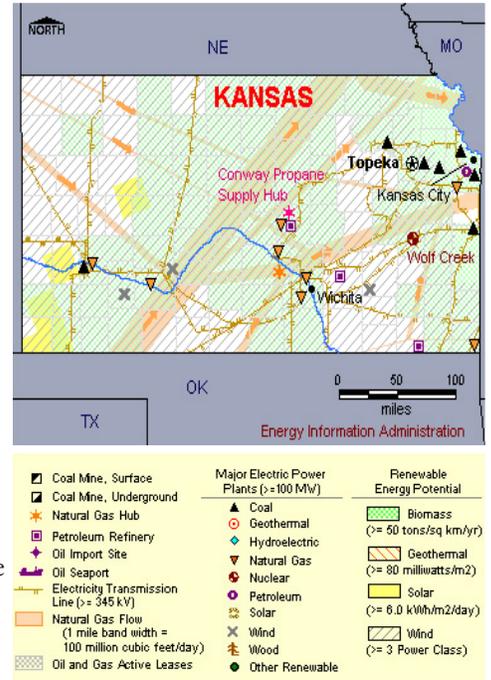
Falling water supplies will threaten every aspect of life in Kansas, from agriculture to industry to residential life.¹⁶ All parts of Kansas are expected to see an average temperature increase of at least 2-4°F, and possibly double the high end of the range in southwestern Kansas. Precipitation is a

thrive. Increased precipitation, in turn, may encourage a boom of rodents, possibly spreading such diseases as leptospirosis, hantavirus, and plague.³⁵ Water quality will likely suffer as a result of more frequent flooding³⁶ even as the frequency of heat waves increases.³⁷ As with the projected cumulative economic effects, the projected cumulative health effects suggest Kansans may be a much less hospitable in the future.

Pay Now: The Benefits of Taking Action

In spite of its current heavy reliance on coal, Kansas is among the states best positioned to take advantage of a transition to clean energy.³⁸ **Kansas ranks 3rd in the country for potential wind energy, and boasts enormous solar³⁹ and biomass⁴⁰ potential.** In fact, the state has the enviable potential to produce 33 times its electrical needs through renewable sources.⁴¹ The work has only just begun, but is quickly gaining steam. While jobs declined 0.3% overall in the state from 1998-2007, clean energy jobs exploded by 51%.⁴²

Policy and infrastructure changes may accelerate the pace of positive development. In May 2009, Kansas passed a comprehensive energy bill requiring non-municipal utilities to generate 10% of their electricity from renewable sources by 2011, stepping up to 15% by 2016, and then to 20% by 2020.⁴³ Construction of a new “clean” coal plant was a compromise necessary to pass the legislation, but plant development comes with a sweetener: construction of new transmission infrastructure that will prove critical to the large-scale exploitation of wind power.⁴⁴ It’s a testament to the can-do prairie spirit that promises a more sustainable Kansas in the future.



Conclusion

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

Kansans 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)

1 Detailed below in “Climate Change: A Real Drag.”

2 Detailed below in “Sinking Fortunes” and “Dust (and Ozone, and Particulates...) in the Wind.”

3 Detailed below in “Pay Now: Benefits to Taking Action.”

4 Pew Charitable Trusts, *Kansas Clean Energy Economy Jobs Grew Faster Than Overall Jobs*, June 10, 2009, 1. http://www.pewglobalwarming.org/cleanenergyeconomy/pdf/KS_Release_09-0610.pdf (accessed August 8, 2010).

5 Union of Concerned Scientists, *Renewing Kansas’ Economy (2004 analysis): A 10 Percent National Renewable Electricity Standard Will Create Jobs and Save Consumers Money*, May 2007, 1. http://www.ucsusa.org/assets/documents/clean_energy/renewing-kansas-

economy-2005.pdf (accessed August 8, 2010).

- 6 U.S. Geological Survey, *Elevations and Distances in the United States*, 2001. <http://egsc.usgs.gov/isb/pubs/booklets/elvdist/elvdist.html#Geographic%20Centers> (accessed August 8, 2010).
- 7 U.S. Energy Information Administration, *State Energy Profiles: Kansas*, 2010. http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=KS (accessed August 8, 2010); National Wildlife Federation, *Global Warming and Kansas*, January 30, 2009. <http://www.nwf.org/Global-Warming/-/media/PDFs/Global%20Warming/Global%20Warming%20State%20Fact%20Sheets/Kansas.aspx> (accessed August 9, 2010).
- 8 Natalia Parra et al., *Economic Impacts of Climate Change on Kansas*, Center for Integrative Environmental Research, University of Maryland, July 2008, 10. <http://www.cier.umd.edu/climateadaptation/Kansas%20Economic%20Impacts%20of%20Climate%20Change.pdf> (accessed August 9, 2010).
- 9 Ibid., 11.
- 10 National Wildlife Federation, *Global Warming and Kansas*. One percent of \$643 million is \$6.43 million; \$6.43 million/year * 40 years [between 2010 and 2050] = \$257.2 million. It is likely that Kansas could suffer more than a 1% loss, however, because Quivira National Wildlife Refuge—which reportedly half of all migratory shore birds in the United States visit—could lose this distinction to a spot further north. National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, “Kansas: Assessing the Costs of Climate Change” in *State Economic and Environmental Costs of Climate Change*, 2008. <http://www.ncsl.org/print/enviro/ClimateChangeKS.pdf> (accessed August 9, 2010).
- 11 National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 2.
- 12 Parra et al., 13.
- 13 National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 2.
- 14 Not adjusted for inflation; \$166 million (\$120 million for tornadoes + \$46 million for hail)*1%=\$1.66 million per year. Over 40 years (\$1.66 million * 40), this totals \$66.4 million.
- 15 Includes agriculture and hunting, fishing, and wildlife viewing contributions to the Kansan economy.
- 16 Union of Concerned Scientists, *Backgrounder: Great Plains*, 2009. http://www.ucsusa.org/assets/documents/global_warming/us-global-climate-change-report-greatplains.pdf (accessed August 8, 2010); National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland; Maril Hazlett, *Climate Change Hits Home: The Risks to Kansas*, Climate and Energy Project and Land Institute, November 2008. http://www.climateandenergy.org/_FileLibrary/FileImage/ClimateStudyFinal.pdf (accessed August 10, 2010).
- 17 Hazlett, 2-3.
- 18 National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 8.
- 19 Hazlett, 3.
- 20 Ibid.
- 21 National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 2.
- 22 Ibid., 1.
- 23 Ibid., 2.
- 24 Ibid., 1.
- 25 Insurance Services Office, Inc., *Insurers to Pay an Estimated \$1.5 Billion in Tornado-Related Damage Losses, A U.S. Record*, May 12, 1999. [http://www.iso.com/Press-Releases/1999/INSURERS-TO-PAY-AN-ESTIMATED-\\$1.5-BILLION-IN-TORNADO-RELATED-DAMAGE-LOSSES-A-U.S.-RECORD.html](http://www.iso.com/Press-Releases/1999/INSURERS-TO-PAY-AN-ESTIMATED-$1.5-BILLION-IN-TORNADO-RELATED-DAMAGE-LOSSES-A-U.S.-RECORD.html) (accessed September 30, 2010).
- 26 Tetra Tech, *Climate Change, Water, and Risk: Current Water Demands Are Not Sustainable*, Natural Resources Defense Council, July 2010, 2. <http://www.nrdc.org/globalwarming/watersustainability/files/WaterRisk.pdf> (accessed August 10, 2010).
- 27 Hazlett, 12.

- 28 Leo Horrigan, Robert Lawrence, and Polly Walker, "How Sustainable Agriculture Can Address the Environmental and Human Health Harms of Industrial Agriculture," *Environmental Health Perspectives* 110 (2002), 447. <http://ehpnet1.niehs.nih.gov/members/2002/110p445-456horrigan/EHP110p445PDE.PDF> (accessed August 10, 2010).
- 29 Union of Concerned Scientists, *Backgrounder: Great Plains*, 3-4.
- 30 U.S. Energy Information Administration.
- 31 Parra et al., 12; National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 2.
- 32 Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services, *Asthma Care Quality Improvement: Resource Guide: Table 1.3. Estimate of Indirect, Direct, and Total Cost Burden of Asthma, by State, for 50 States, District of Columbia, and Puerto Rico, 2004*. http://www.ahrq.gov/qual/asthmacare/asthmatable1_3.htm (accessed October 14, 2010).
- 33 Parra et al., 12; National Conference of State Legislatures and Center for Integrative Environmental Research, University of Maryland, 2.
- 34 Hazlett, 2.
- 35 Parra et al., 12. Source notes that malaria is unlikely to spread, and Rocky Mountain spotted fever might actually decrease.
- 36 *Ibid.*, 9.
- 37 Hazlett, 5.
- 38 *Ibid.*, 8.
- 39 *Ibid.*
- 40 National Wildlife Federation, *Charting a New Path for Kansas's Electricity Generation and Use*, 2008. http://www.nwf.org/Global-Warming/-/media/PDFs/Global%20Warming/Clean%20Energy%20State%20Fact%20Sheets/KAN-SAS_10-22-16.ashx (accessed August 10, 2010).
- 41 Union of Concerned Scientists, *Renewing Kansas' Economy*, 1.
- 42 Pew Charitable Trusts, 1.
- 43 Pew Center on Global Climate Change, *Kansas Energy Legislation*, June 2009. <http://www.pewclimate.org/node/6557> (accessed August 10, 2010).
- 44 Keith Johnson, "Coal in Kansas: Sunflower Will Get a Coal Plant, State Gets More Renewables," Environmental Capital blog, *Wall Street Journal*, May 5, 2009. <http://blogs.wsj.com/environmentalcapital/2009/05/05/coal-in-kansas-sunflower-will-get-a-coal-plant-state-gets-more-renewables/> (accessed August 10, 2010).