KENTUCKY FACTS

AMERICAN SECURITY PROJECT

Pay Now, Pay Later: Kentucky

The Environmental Protection Agency warns that climate change could reduce wooded areas of Kentucky by as much as 25%—harming its staple forestry industry, which employs approximately 37,500 Kentuckians and provides $6.4 billion to the economy.[1]

Energy costs in the Southeast will, in a business-as-usual scenario, rise by an additional $59.2 billion by 2100 as a result of increasing temperatures.[2]

Energy reform in Kentucky could reduce energy costs by $1.2 billion annually in 2020 and by $2.2 billion annually in 2030[3]—over $500 in annual savings for every state resident by 2030.[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 Kentucky $40.6 billion in GDP and nearly 290,000 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 Kentucky faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows that Kentucky is poised to benefit from the research, development, and distribution of renewable energy technologies. The University of Kentucky's Renewable Energy Initiative, for example, has nearly 200 active projects funded by the Department of Energy or directly related to energy, totaling over $50 million in current funding from federal, state, and other sponsors.[5] Should we fail to take action against climate change, Kentuckians have much to lose.

Pay Later: The Cost of Inaction

A vital sector in the Kentuckian economy, timberlands could see declines of up to 25% as a result of climate change.[6] Kentucky's $11 billion tourism industry is also at risk due to environmental changes.[7] Extreme weather events such as floods and droughts could become increasingly common, accumulating increased costs for the state.[8] In addition carbon-intensive energy, such as coal mining, will continue to pose health hazards for Kentuckians working in mines and living in nearby communities.

Migrating Hardwood Forests

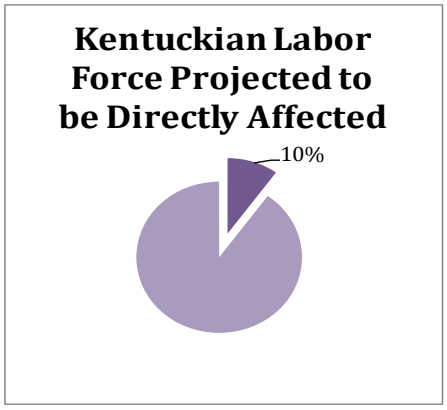
Climate change could alter the composition of Kentucky's forests, which cover over 11 million acres,[9] jeopardizing profits and jobs. **Wood-based industries in Kentucky generate roughly $9.3 billion in revenue and employ approximately one out of every nine manufacturing workers in the state.**[10] The state's wood industries are highly dependent not only on the abundance of forests, but also on their composition.[11]

Kentucky's $11 billion tourism industry is also at risk due to environmental changes. Extreme weather events such as floods and droughts could become increasingly common, accumulating increased costs for the state.

Between 1988 and 2004, there was a reduction in stocking values of 11 species of oak trees[12]—perhaps a result of warming temperatures. Such losses threaten the logging industry, which relies on eastern hardwood trees that could increasingly be replaced by scrub oaks and other less commercially valuable trees better adapted to warmer temperatures.[13]

Changes in forest composition or decreases in wooded areas could

also affect Kentucky's tourism industry, which provides $11 billion[14] **in revenue for the state annually**. Changes in water supply, should natural ecosystems and fresh water sources begin to dry, could also contribute to industry-wide suffering. Specifically, climate change jeopardizes outdoor recreation, including angling, hunting, and wildlife viewing, all part of the Kentucky lifestyle—2.4 million people participated in 2006. Moreover, this sector generates nearly 20% of the tourism revenue and is home to roughly 41,700 jobs. The trout population is expected to decrease in the Appalachian region by 61%; other animal species, such as the Kentucky warbler, may cease breeding in the state altogether.[15] Rising temperatures will also shorten the lifespan of Kentucky's famous bluegrass, which thrives on temperatures around 60°F.[16]

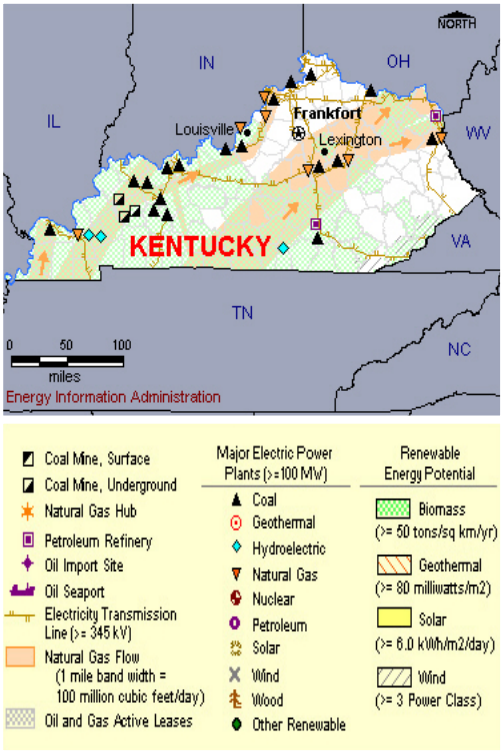


Sources: Drape; University of Kentucky—College of Agriculture; Bureau of Economic Analysis[17]

Health Risks

Kentucky's current sources of energy not only harm the climate, they also harm its residents. The state produces 10% of America's coal, which means that while coal is shipped to other states, Kentuckians bear a burden of environmental degradation and health hazards associated with this industry. Coal production is linked to increased "rates of cardiopulmonary disease, lung disease, cardiovascular disease, diabetes, and kidney disease" amongst people living in the area. **The fine particle pollution emitted from coal-fired electric plants contributes to 745 premature deaths, 639 hospitalizations, and 1,022 heart attacks in Kentucky each year.**[18]

Coal-fired power plants introduce mercury into the environment, which is an additional health hazard for Kentucky residents. Mercury is a neurotoxin that is particularly harmful to pregnant women and young children. Unfortunately, **the state's 9,431 miles of river ways and 228,385 acres of lakes are all under advisory for mercury contamination.**[19]



Pay Now: The Benefits of Taking Action

If Kentucky acts now, it stands to gain substantial economic benefits. Reforms and increased energy efficiency measures are predicted to save money and create jobs for Kentucky's residents. To this end, the Commonwealth has created the Kentucky Climate Action Plan Council, with the aim of developing and recommending a comprehensive climate mitigation policy. In this connection, the state's first comprehensive energy plan, put forward in November 2008, "calls for significant reductions in greenhouse gas emissions while creating some 40,000 jobs tied to energy production and conservation between now and 2025."[20]

Kentucky has the potential to capitalize on its large agricultural sector by producing bioenergy that can be converted to electricity or used as a fuel such as ethanol.[21] By employing a variety of bioenergy sources such as soybeans, corn, bluegrass, switchgrass, bark, and agriculture residue, the Bluegrass State has the potential to produce 25 million tons of biomass annually by 2025.[22] **The Kentucky governor's office estimates that biomass production and processing could add $3.4 billion of net output each year and 10,000 jobs to Kentucky's economy.**[23]

Increasing energy efficiency by using existing green technologies could generate 10,600 new jobs in Kentucky by 2020, and 14,300 by 2030. Energy efficiency would also save $1.2 billion annually by 2020, and $2.2 billion per year by 2030.[24] Energy efficient technology such as heat pump water heaters, geothermal heat pumps, and super boilers can improve energy efficiency, reduce Kentucky's energy consumption, and

create new jobs for its residents.[25] The state of Kentucky, moreover, offers residents and businesses a host of financial incentives to encourage energy efficiency and renewable energy generation.[26]

By decreasing dependence on coal, Kentuckian families can improve their health and save money. Coal-burning power plants release 66% of the annual sulfur dioxide emissions, 33% of annual mercury emissions, and 22% of annual nitrogen oxide emissions in Kentucky.[27] Each ton of sulfur dioxide that is removed creates a public health savings of $7,300. **The Commonwealth has the potential to save $3.5 billion should it replace the 482,654 tons of sulfur dioxide emissions from coal-fired electric power plants with clean energy**. Each ton of nitrogen oxide removed creates a public health savings of $1,300. **Replacing the 198,541 tons emitted by coal-fired electric power plants with clean energy would save Kentuckians $258 million**.[28]

Clean energy is good business for Kentucky. In 2007, the University of Kentucky's more than $50 million in energy-related research projects included, for example, the development of novel technologies for the production and storage of hydrogen from coal, as well as research on the production of biofuel from canola and sunflower seeds.[29] Kentucky has already started the transition to a greener economy: as of 2007, it had over 9,000 jobs and 700 businesses in the clean energy sector.[30] However, with over 209,000 unemployed workers, Kentucky could benefit substantially from increased investment in clean energy.[31]

Conclusion

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

Kentucky residents 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 Center for American Progress, *The Economics of Clean Energy in Kentucky,* October 6, 2009, 3. **http://images2.americanprogress.org/CAP/2009/10/hub/EconomicsCleanEnergy_KY.pdf** (accessed November 1, 2010).

2 National Resources Defense Fund, *The Cost of Climate Change: What We'll Pay if Global Warming Continues Unchecked,* May 2008, 11. **http://www.nrdc.org/globalwarming/cost/cost.pdf** (accessed September 24, 2010).

3 Georgia Institute of Technology, Duke University, *State Profiles of Energy Efficiency Opportunities in the South: Kentucky,* April 13, 2010, 8. **http://www.seealliance.org/se_efficiency_study/kentucky_efficiency_in_the_south.pdf** (accessed September 24, 2010).

4 Based on 2009 population estimate. U.S. Census Bureau, *State and County Quick Facts*, 2009. **http://quickfacts.census.gov/qfd/states/21000.html** (accessed September 24, 2010).

5 University of Kentucky, *Research: UK Renewable Energy Initiative*. **http://www.research.uky.edu/renewable_energy.html** (accessed November 18, 2010).

6 Center for American Progress, 3.

7 Tourism in Kentucky in 2008 was valued at $11 billion. Kentucky Department of Travel and Tourism, *Marketing Plan 2009-2010*, November 2009, 1. **http://www.kentuckytourism.com/!userfiles/Industry/homepage/2010-11-Marketing-Plan-MS-indd.pdf** (accessed September 24, 2010).

8 National Wildlife Federation, *Global Warming and Kentucky*, January 30, 2009, 1. **http://www.nwf.org/Global-Warming/~/media/PDFs/Global%20Warming/Global%20Warming%20State%20Fact%20Sheets/Kentucky.ashx** (accessed November 17, 2010).

9 U.S. Forest Service, *Shifts in Relative Stocking of Common Tree Species in Kentucky from 1975 to 2004*, 2004, 194. **http://nrs.fs.fed.us/pubs/gtr/gtr-p-24%20papers/23oswalt-p-24.pdf** (accessed September 30, 2010).

10 University of Kentucky—College of Agriculture, *Kentucky Fact Sheet,* January 2007, 1. **http://www.ukwoodcenter.net/misc/for53.pdf** (accessed September 24, 2010). Kentucky's forest industries ship $6.4 billion worth of products annually; $2.9 billion in value is added subsequently in processing and finishing.

11 National Wildlife Federation, *Global Warming and Kentucky*, 2.

12 Stocking, according to the forest Service is defined as, "the degree of occupancy of land by trees, measured by basal area or the number of trees in a stand, compared with a minimum standard, depending on tree size, required to fully utilize the growth potential of the land" U.S. Forest Service, 194-5, 199-200.

13 National Wildlife Federation, 2.

14 Kentucky Department of Travel and Tourism.

15 National Wildlife Federation, 1-2.

16 Texas Cooperative Extension, *Kentucky Bluegrass*. **http://aggie-horticulture.tamu.edu/archives/parsons/turf/publications/bluegrass.html** (accessed September 30, 2010).

17 Based on the 2009 employed Kentuckian labor force and includes those employed in the agricultural sector, tourism-related jobs and one in nine manufacturers. Bureau of Economic Analysis, *SA25N Total full-time and part-time employment by NAICS industry 1/ -- Kentucky*, September 20, 2010. **http://www.bea.gov/regional/spi/default.cfm?selTable=SA25N&selSeries=NAICS** (accessed November 1, 2010).

18 ABT Associates, *Dirty Air, Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, 14. **http://www.catf.us/resources/publications/files/Dirty_Air_Dirty_Power.pdf** (accessed August 10, 2010); Kentuckians for the Commonwealth, *The Silent Cost of Coal-Based Electricity,* 2. **http://www.kftc.org/publications/nancys-research/The%20Silent%20Costs%20of%20Coal-Based%20Electricity.pdf** (accessed September 30, 2010).

19 Ibid.

20 Kentucky Climate Action Plan Council, *Background: What Kentucky Is Already Doing.* **http://www.kyclimatechange.us/background-alreadydoing.cfm** (accessed December 1, 2010).

21 While burning waste does release greenhouse gases, it remains a superior alternative compared to fossil fuels. Moreover, when crops are grown for biofuel, the carbon intake by the plants is typically equal to the amount released in their combustion. The government also has in place scrubbing and filtering requirements for biofuel plants. Energy Information Administration, *Biomass*. **http://www.eia.doe.gov/kids/energy.cfm?page=biomass_home-basics** (accessed November 1, 2010).

22 Kentucky Governor's Office of Agricultural Policy and Energy and Environment Cabinet, *Biomass and Biofuels Development in Kentucky,* 2009, 7. **http://agpolicy.ky.gov/Documents/091210_BiomassTaskForce_FinalReport.pdf** (accessed September 30, 2010).

23 Ibid., 42.

24 Georgia Institute of Technology, Duke University, 8.

25 Ibid.

26 Database of State Incentives for Renewables and Efficiency, *Kentucky: Incentives/Policies for Renewables and Efficiency*, **http://www.dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=KY** (accessed November 18, 2010).

27 The Silent Cost of Coal-Based Electricity, 3.

28 Clean Air Task Force, *Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefits of Alternative Emission Reduction Scenarios*, 2004. **http://www.catf.us/resources/publications/files/Power_Plant_Emissions.pdf** (accessed September 30, 2010); The Silent Costs of Coal-Based Electricity, 3.

29 University of Kentucky.

30 Pew Charitable Trusts, *Clean Energy Economy: Executive Summary,* June 2009, 51-52. **http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf** (accessed September 30, 2010).

31 Bureau of Labor Statistics, *States and Selected Areas: Employment Status of the Civilian Noninstitutional Population, January 1976 to Date, Seasonally Adjusted*, September 2010. **http://www.bls.gov/lau/ststdsadata.txt** (accessed November 15, 2010).