WYOMING FACTS

AMERICAN SECURITY PROJECT

Pay Now, Pay Later: Wyoming

Temperature increases are expected to cause Wyoming's mountain snowpack to decrease, resulting in exacerbated droughts, lost revenue to ski resorts, and reduced summer stream flows.[1]

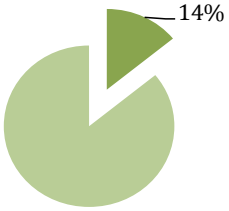
Loss of wildlife habitat could mean significant losses to the state's nearly $1 billion hunting, angling, and wildlife watching industry, which supports over 16,000 jobs.[2]

Wyoming is ranked 13th in wind power capacity—and has under discussion what has the potential to become one of the world's largest wind farms.[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 Wyoming $3 billion in GDP and over 19,000 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).*

Wyomingite Labor Force Projected to be Directly Affected



Source: Bureau of Economic Analysis[6]

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 Wyoming faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows Wyoming is poised to benefit from the research, development, and distribution of renewable energy technologies. Wyoming has a budding wind energy industry in addition to great solar potential. Wyoming is also capable of producing 1.5 million tons of biomass each year, which could generate 300 MW of electricity.[4] Should we fail to take action against climate change, the people of Wyoming have much to lose.

Pay Later: The Cost of Inaction

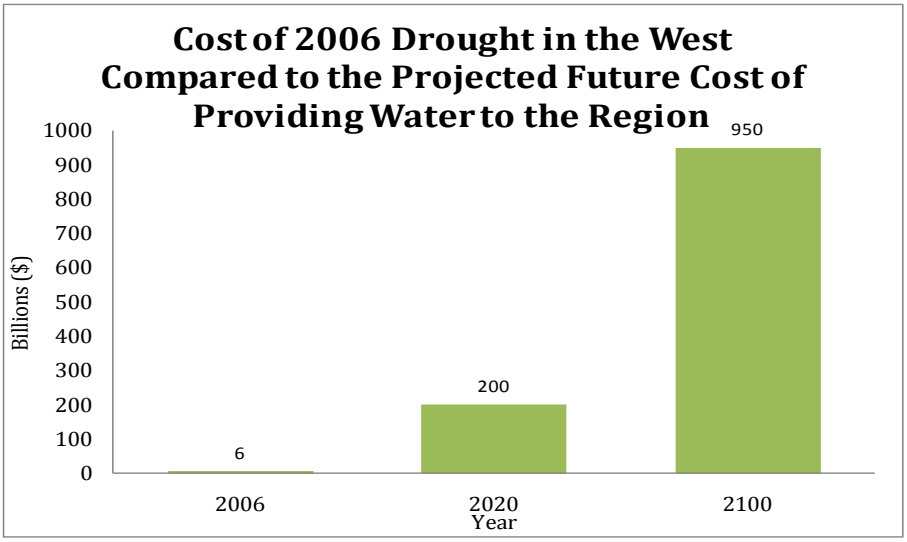
From its nickname as the Cowboy State, to being the home of the world's first national park,[5] Wyoming has a long history as both a home and a host of outdoor enthusiasts. But this part of the state's culture, as well as its water supply, ecosystems, and revenue in the tourism and ranching industries, is threatened by climate change. Wyoming stands to lose thousands of jobs and millions in revenue.

Big Wyoming under Threat

Scientists project that the average temperature in Wyoming could rise by almost 7°F by 2100, leading to a loss of wildlife, ecosystems, and tourism dollars across the entire state.[7]

True to its name, Big Wyoming is home to a wide variety of plant and animal species—and, most notably, Yellowstone, the country's first national park.[8] A small increase in temperature could force species, typically found farther south, to begin moving north, creating a host of invasive species and crowding out native species,[9] many of which are already threatened or endangered such as the lynx and grizzly bear.[10]

Other threats to Wyoming's environment will come from projected warmer and drier summers. Warmer temperatures will result in more severe insect and pest outbreaks, such as the tree killing pine bark beetle. Wyoming is also likely to see an increase in wildfires,[11] which will destroy more and more of the state's unique ecosystem as a result of higher temperatures and drought. The 1988 Yellowstone fire, for example, cost $120 million to extinguish[12]—and as fire severity and



Source: Center for American Progress[15]

frequency increase so will associated costs.

This combination of pests and fires could reduce the whitebark pine forests by as much as 90% in 50 years.[13] These forests provide an important food source for many of the animals that make up Wyoming's unique landscape. An increase in temperature is also expected to have detrimental effects on the trout stream habitat: **up to 50% of this habitat in the Rocky Mountain region could be destroyed by the end of the century**,[14] disrupting a favored pastime for generations of anglers.

In 2006, visitors to Wyoming spent almost $1 billion on hunting, fishing, and wildlife viewing; the industry supported 16,105 jobs throughout the state.[16] As tourism is the second largest industry in the state,[17] losing even a small percentage of the landscape and wildlife would have severe repercussions. **Travelers spent roughly $2.7 billion ($7.4 million each day) in 2007, contributing $108 million in 2007 to state and local taxes. Without this tax revenue, each household would have owed the state and localities $527 more in taxes**.[18]

Snowpack Decreases

Warmer temperatures throughout the year are expected to lead to less snowpack in the Rockies.[19] This could in turn have serious adverse effects on Wyoming's ski industry, as seasons may become increasingly erratic and resorts may have to spend more on the expensive, artificial generation of snow.[20] Skiing, snowboarding, and other outdoor winter activities could also become more dangerous since winter warming can trigger avalanches.[21]

In addition, snowpack stores and supplies a significant amount of Wyoming's clean water used for agriculture, drinking, and by wildlife—a decrease in snowpack could accordingly lead to water shortages throughout the state.[22] Most recently, **Wyoming has been plagued by drought since 1999.**[23] Western states, including Wyoming, have already set aside $2.5 billion to tackle the consequences of drought; this includes watershed planning, utilization of ground water (including its contentious proposed transport via pipeline), and storage of water in surplus years.[24]

Stressed Ranchers and Farmers

Almost 90% of the state's farmland is pastureland[25]—**cattle products alone were valued at nearly $600 million in 2008**.[26] Unfortunately for Wyoming's ranchers, cattle can begin to suffer heat stress at about 85°F, and become more uncomfortable as the heat and humidity increase.[27] Temperatures in Wyoming are predicted to increase markedly with unmitigated climate change, thus potentially raising summer temperatures from their current averages, which range between 70°F-80°F.[28] Under heat stress, animals are less able to produce milk, gain weight, or reproduce. This could pose huge losses for this multi-million dollar industry.[29] **If temperatures continue to increase, this industry could be irreversibly damaged**.

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Wyoming ranks 8th in the nation for barley production (with a crop value

of $32 million in 2008), and the state's foremost crop is hay (with a $65 million crop value in 2008).[30] In 2007, 13 counties, worth $52 million in crops, were found to be at risk of water shortage.[31] It is possible that a larger percentage of the state's counties and farmland would be added to this list given unmitigated climate change.

Pay Now: The Benefits of Taking Action

While Wyoming is home to fewer green economy jobs than any other state, jobs in this sector grew 56.4% between 1998 and 2007, significantly higher than the 14% overall job growth rate during this period. The state stands to benefit greatly from the push for increased green technology and energy throughout the United States. The clean energy industry attracted almost $7 million in venture capital investment between 2006 and 2008.[32] Throughout the country, investment in renewable energy sources is expected to create approximately three times more jobs than an equivalent investment in fossil fuels.[33]

Wyoming is ranked 13th in wind power capacity—and has under discussion what has the potential to become one of the world's largest wind farms.[34] Surplus energy from this farm and elsewhere can be exported to other states in need, increasing the revenue of the wind farm and the gross state product. In 2005, governors from four states committed to build a high capacity power line to allow excess energy from Wyoming to reach high demand markets in California.[35]

Wind energy will also contribute to the local economy. **Foote Creek Rim Wind Farm, located in Carbon County, will contribute in excess of "$9 million in property taxes, nearly $4 million in sales taxes and over $5 million in royalty payments to landowners" over the course of 20 years.**[36] Furthermore, since wind energy creates jobs, community colleges have begun offering wind turbine operator programs, providing opportunities for students after graduation.[37]

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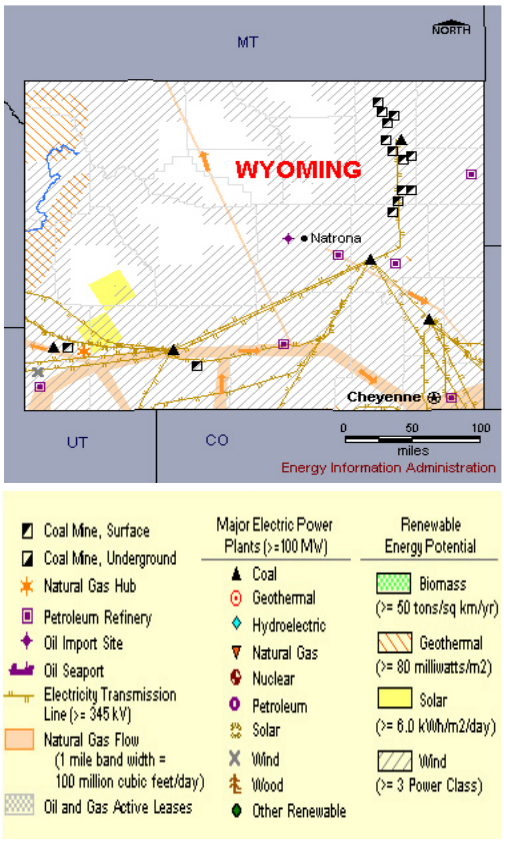

Wyoming is almost constantly under bright sunlight—enough to produce 4,500-5,500 watt-hours per square meter; a single square mile devoted to solar power could power 1,300 houses each year.[38] **Indeed, Wyoming has the potential to produce enough energy to power about 7 million homes each year, using just 0.5 percent of the state's total area.**[39] The state has already implemented, among other incentives, a rebate program for homeowners installing solar panels.[40]

General Electric (GE) and the University of Wyoming have started a collaborative effort at the Powder River Basin, where they will experiment with GE's clean coal technology.[41] Although not as clean as solar or wind energy, gasifying coal before burning it allows more particulate matter to be captured, while also reducing nitrogen oxide[42] by 33%. Additionally, this process requires 30% less water than traditional methods of coal energy production. The facility is expected to be operational by 2012, and could yield new uses for Wyoming's coal.[43]

Conclusion

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

Wyomingites 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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