GEORGIA FACTS

AMERICAN SECURITY PROJECT

Pay Now, Pay Later: Georgia

Sea levels along Georgia's 100-mile coastline, currently rising at a rate of 13 inches each century, could rise as much as 25 inches by the century's close.[1]

Corn and wheat account for 13% of Georgia's total crops; by 2020 yields from these crops could decrease by 15-20% in certain regions of the state due to temperature changes, causing significant disruption to the agriculture industry.[2]

Georgia has the potential to reach $4.6 billion in clean energy investments which will likely generate 59,000 green jobs by 2016.[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 Georgians $102.9 billion in GDP and over 752,000 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 projects, as we have used in our research, however, allow us to see that Georgia faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows that Georgia is poised to benefit from the research, development, and distribution of renewable energy technologies. Georgia has an abundance of natural resources including pine trees and agricultural products; the state ranks 3rd in the country in biofuel potential.[4] By 2007, clean businesses in Georgia generated more than 16,000 jobs[5] and there is potential for many more. Should we fail to take action against climate change, Georgians have much to lose.

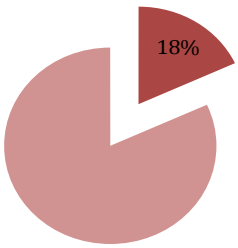
Pay Later: The Cost of Inaction

Average temperatures in Georgia could rise by an estimated 4.5ºF in winter and 5.4ºF in summer, with an accompanying 5% annual increase in precipitation this century.[6] Such a change, coupled with more frequent and severe storms as a result of climate change, will affect many segments of Georgia's economy, including: transportation, shipping, energy infrastructures; paper and wood product manufacturing; agriculture; and the tourism and recreation industries.

Buckling under the Heat

Georgia's 100-mile coastline is home to an extensive web of roadways, shipping routes, and energy infrastructures. The transportation sector contributed more than $15 billion to Georgia's gross state product (GSP) in 2008.[7] The manufacturing industry, which constitutes 12% of GSP,[8] depends heavily on the transportation industry. Any disruption to either transportation or manufacturing will significantly damage the economy as a whole.

Georgian Gross State Product Projected to be Directly Affected



Source: Bureau of Economic Analysis[9]

Four major interstates cross Georgia; much of I-95 lies within five miles of the coast. In 2007, the state spent nearly 10% of its budget on transportation and maintenance. Pavement buckling due to intense heat or flooding would necessitate increased maintenance and cause major disruption. **A 1% increase in maintenance expenditures could cost other sectors of the economy $12 million.**[10]

Over 24 million short tons of goods passed through Savannah and Brunswick (near I-95) in 2007. "Savannah is the fastest growing container port in the eastern United States and Port Brunswick is the fourth largest auto port in the eastern US."[11] Increased hurricane activity and rising sea levels pose a serious threat to these ports; the Georgia Ports Authority will need to make changes to ensure their continued viability.[12]

Georgia's rail system is one of the most extensive in the Southeast, consisting of 4,700 miles of tracks.[13] Increasingly frequent and severe precipitation and hurricanes are likely, however, to cause damages to the system, possibly raising the maintenance and operating costs.

Passenger and freight air travel are also vital components of the state's transportation infrastructure. **Atlanta has the country's busiest passenger airport, serving more than 38 million passengers in 2009;**[14] **Georgia alone accounts for 8% of the U.S. gross domestic product for air transportation.**[15] Since most airline delays result from inclement weather, an increase in severe weather could be highly detrimental.

Health of Critical Industries Linked to Climate Change

The energy-intensive paper and wood product industries, which in 2005, contributed a crucial $3.3 billion and $1.9 billion, respectively, to GSP, account for much of Georgia's energy consumption.[16] Climate change could potentially benefit this industry; warmer weather could cause pine forests to expand northward, and wetter weather would encourage more oak and hickory trees.[17] By 2040, the wood manufacturing industry is expected to see an 11% increase. This would likely create 6,531 direct and indirect jobs and add nearly $350 million to the economy. An unfortunate side effect, expenses would arise with water shortages and increased energy use.[18] Furthermore, Georgia's industrial sector is the largest consumer of the state's coal-fired electricity plants; expanding this industry would likely require a deeper dependency on coal, and build on the already existent health risks for state residents.[19]

Agriculture contributed more than $3.1 billion to Georgia's economy in 2007,[20] and if average yearly temperatures continue to rise, as some predict, the implications for farmers will be considerable. Crop yields are clearly vulnerable to any changes in climate; however, estimates about the expected nature of change vary. **One study estimates that by 2020, corn yields will drop by up to 15%, and similarly, that, in certain parts of the state, winter wheat yields will fall by up to 20%. The same study predicts soybean and peanut yields may increase by up to 25% in the state's northern regions; peanut yield may decrease by 5% in the southern part of the state, however.**[21]

Furthermore, the agricultural industries, as well as the paper and wood processing sector, will have to compete with the energy and residential sector for scarce water supplies, resulting in increased costs.[22] Droughts resulting from higher temperatures and the evaporation of surface water could negate some of the benefits described above. **An extreme drought throughout the state in late 2007 cost Georgia $1.3 billion in damage. Crop losses from the drought included "$83.8 million in hay, $160.1 million in cotton, $92.5 million in peanuts and $63.1 million in corn."**[23]

In addition, Georgia's geography is exposed to a variety of storms, including hurricanes, tornadoes, and ice storms. Each tornado causes nearly $300,000 worth of damage,[24] and if the frequency and intensity of hurricanes and other storms increases as predicted, additional costs to the state could skyrocket.

Georgia Used to Be On My Mind

Wildlife viewing, hunting, and fishing brought in over $3.5 billion to Georgia in 2006.[25] Over 10% of Georgia's 77 state parks and historic sites can be found along the coast. They attracted more than 600,000 visitors in 2009.[26] Climate change could lead to loss of habitat, endangering a number of the species that appeal to visitors. Rising sea levels could increase maintenance costs and threaten tourism revenue. Estimated damage from rising sea levels to critical habitat for shrimp, oysters, and other species vulnerable to salt-water intrusion into coastal marshes will also jeopardize Georgian fisheries.[27]

Properties along Georgia's coastline face a serious threat from rising sea levels and the potential for increasingly severe and frequent hurricanes.

Climate change could lead to loss of habitat, endangering a number of the species that appeal to visitors. Rising sea levels could increase maintenance costs and threaten tourism revenue.

The real estate sector is responsible for generating 10% of Georgia's GSP.[28] **Not only are high-value coastal properties at risk, but the cost of protecting Georgia's coastline, via sand replenishment, from a 20-inch rise in sea level could reach between $154 million and $1.3 billion by the end of the century.**[29] As many as 5,000 jobs could be lost as a result of coastal erosion.[30] In 2004, Hurricane Ivan cost Georgians $68.8 million in property damages.[31]

Public Health Risks Increase

Fine particle pollution from coal-fired electric plants contributes to, on average, 946 deaths, 837 hospitalizations and 1,352 heart attacks every year in Georgia.[32] In addition, as the heat rises, mortality rates increase. A Johns Hopkins School of Public Health study identified a "minimum mortality temperature" (MMT), which when surpassed, leads to a steady increase in heat-related deaths. The researchers found that, for each degree centigrade above the MMT in Atlanta, heat-related mortality increases by 5.4%.[33] Another Johns Hopkins study found a positive correlation between heavy precipitation and the abrupt increase in waterborne diseases, particularly significant for Georgia because of its abundant marshlands.[34]

Pay Now: The Benefits of Taking Action

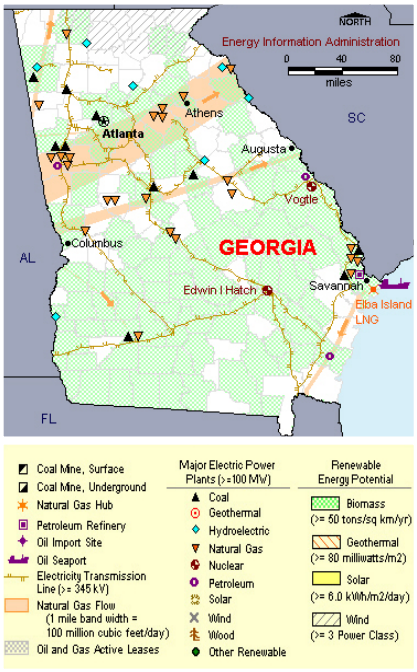
Georgia ranked 9th among states in total energy consumption in 2008.[35] Coal and nuclear power provide much of the state's electricity; both use large amounts of water for operating and cooling. Demand for increasingly limited freshwater resources will add to electricity generation costs and increase the strain on the water supply, especially during droughts. Coal-fired power plants also introduce mercury[36]—particularly harmful to pregnant women and children—to the environment, which will further decrease the state's reliable freshwater supply.

Georgia has much to gain from investment in renewable, clean technology—and has the potential to provide more than 20% of its electricity needs with renewable resources.[37]

Georgia has already added over 16,000 jobs in the clean energy sector and could add more than 50,000 jobs by 2016.[38] **The state ranks 9th in clean energy patents, and venture capital investment in the clean energy sector amounted to almost $180 million for 2006-2008, 10th in the nation.**[39] Renewable energy projects are expected to add nearly $5 billion to the state's economy over the next 10 years.[40]

The potential jobs in the clean energy sector will encompass a range of occupations from construction and manufacturing to research and development. There is already a market for green sector manufactured goods; for example, wood pellets are currently in demand in Europe to meet renewable-energy mandates for reducing greenhouse gases caused by coal. **The biomass-to-energy projects already operating or announced account for $1.8 billion in investment in the state and 570 jobs.**[41]

Research and development is an important component of Georgia's clean energy production initiatives. The U.S. Department of Energy opened a University Center of Excellence for Photovoltaics Research and Education at Georgia Tech University,



one of only two such centers in the country. Georgia's Center of Innovation for Energy, established in 2008, supports the expansion, production and use of renewable energy and biofuels. Georgia has the opportunity to be a leading voice for green technology innovation.

Conclusion

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

Georgians 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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