

Potential and Perspectives

Green jobs in Georgia

Beata D. Kochut

Over the years, the Selig Center has reported on emerging economic trends and industries in Georgia, such as telecommuting, transactions processing and the life sciences industry. In these uncertain economic times, we continue to analyze the state's economy, and work to identify the factors likely to shape the state's economic future. This time, we set out to assess the general outlines of the "green economy" in Georgia: the state's resources, potential, and prospects.

While widely discussed and often singled out as the way out of the current economic crisis, the definitions of the green economy tend to vary. One of the definitions, espoused by the Political Economy Research Institute at the University of Massachusetts, describes the green economy as one "based on the efficient use of energy, reducing polluting emissions, and the use of renewable sources of power." With this definition in mind, this discussion will focus on the "greening" of the economy, or the processes and trends rather than their end result.

The green economy is a sensitive topic. Critics see the push toward conservation and renewable energy as an unnecessary government intervention and dispute the science of global warming, often the underlying reason for some of the green economy initiatives. Others see green jobs as a

vehicle of economic revitalization, which will play a role in pulling the country out of economic recession.

While many aspects of the "green economy" are highly debatable, few will argue with the underlying principles of increasing energy efficiency, reducing dependency on foreign oil, and having a clean environment. Hence it is safe to say that the "greening of the economy" will remain in the forefront of the country's and Georgia's economic future. The prospects for new jobs and investment generated by the "greening" trends will depend on many factors, with the price of energy and government regulations among the most important.

Even though it is difficult to predict the fluctuation of oil prices, in the long term, increased global demand, combined with increased cost and limits put on the exploration and exploitation of oil fields, are likely to drive up the price of energy in the years to come. With the increasing cost, the interest in energy efficiency and the investment in new energy sources will intensify. In addition, the concern about air quality and the corresponding federal and state regulations are sure to increase the demand for services and products that cut down on harmful emissions.

In Georgia, the above-average per capita energy use and excessive levels of air pollution in several metropolitan counties create a high potential for savings and improvements, and, therefore, good prospects for those employed in green industries and occupations.



Green Jobs for Georgia

Even though the term "green jobs" conjures notions of something new and unknown, the majority of occupations likely to flourish in the green economy are well established. What makes them "green" is the investment in energy efficiency, clean environment, and renewable energy sources. For example, investment in more energy-efficient buildings would create demand for electricians, carpenters, and insulation workers, among others. Investment in mass transit would create demand for the services of civil engineers, welders, metal fabricators, and dispatchers, for instance. An increased use of biofuels would result in additional jobs for agricultural and forestry workers and chemical engineers, to name a few.

The move toward increased energy efficiency and independence is likely to generate jobs ranging from research and development, to manufacturing and construction. It is also likely to spur interest in new technologies and materials applied in the fields of renewable energy, construction, utilities, and transportation.

Energy Efficiency

Between 2000 and 2006, Georgia's residential per capita energy use increased at a much faster pace than the national average. While the commercial, industrial, and transportation

sectors' use of energy increased by 4.6 percent, residential use increased by 7.4 percent. With the relatively high per capita energy use, and the projected energy costs escalating in the coming years, increasing energy efficiency in Georgia's households has a potential to provide significant savings.

Green Jobs

Building Retrofitting

Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Installers, Truck Drivers, Construction Managers, Building Inspectors

In 2008, the American Council for Energy Efficient Economy ranked Georgia 36 among the 50 states in policies promoting energy efficiency. Of the nine policies possible, Georgia has instituted only three: energy-efficient building codes, smart growth and public transport policies, and utilities sector policies. Other areas where state policy could make a difference in terms of energy efficiency include climate change mitigation policies, appliance and equipment standards, vehicle policies, tax incentives, clean distributed [power] generation, and "lead by example" policies.

In the short term, energy can be saved by retrofitting buildings and moving toward more efficient appliances. Today, the most efficient investments in building retrofitting include roof and floor insulation, energy-efficient lighting, thermally efficient windows, improved heating and cooling systems, and renewable energy systems. Over the longer term, a smart energy grid combined with new technologies in construction and materials will likely come into play.

According to the 2005 study commissioned by the Georgia Environmental Facilities Authority, instituting energy efficiency policies in the residential sector alone would generate between \$3 billion and \$6 billion in cumulative net savings to the state over ten years (2005 to 2015), depending on the scope of these policies. Measures applied to the commercial and industrial sectors would produce net savings of \$2 billion to \$4 billion, and \$3 billion to \$7 billion, respectively. By 2015, investments in energy efficiency would generate anywhere between 1,500 and 4,200 additional jobs, primarily in construction and retail, and from \$48 million to \$157 million in personal income.

Renewable Energy

Recent data show that, of the eleven states in the Southeast, Georgia is the second largest producer of electrical power. About 4 percent of Georgia-generated electricity comes from renewable energy sources, specifically, hydro, biomass, and

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Robert T. Sumichrast
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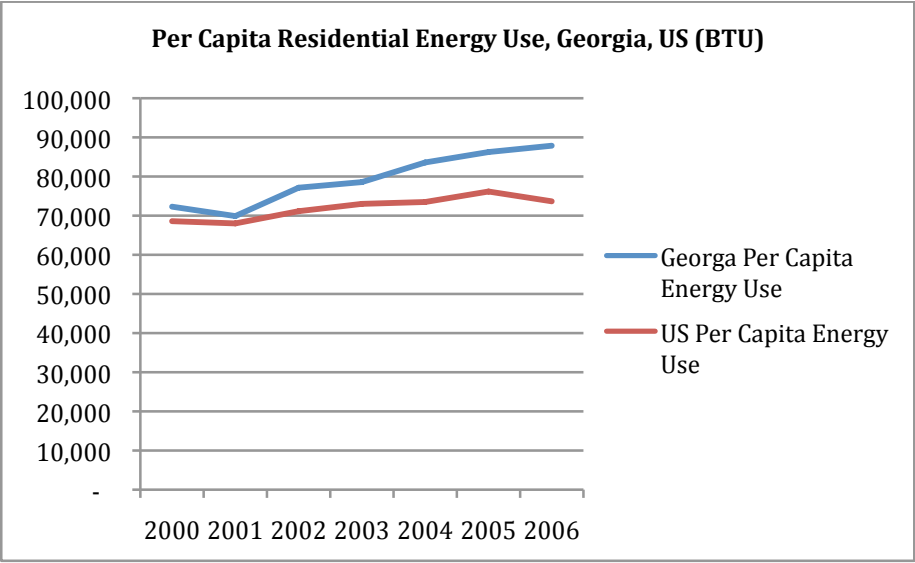
Jeffrey M. Humphreys
Director

Lorena M. Akioka
Editor

Beata D. Kochut
Research Analyst

Stephen F. Kuzniak
Data Analyst

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Source: Selig Center for Economic Growth, based on data from the U.S. Census Bureau and the U.S. Department of Energy.

wind. According to the Southern Alliance for Clean Energy, Georgia’s renewable energy potential comes from wind, sun, and biomass, where Georgia out-indexes the Southeast by 15.1 percent, 9.7 percent, and 2.2 percent, respectively.

Geographically, Georgia’s mountainous north and its coast have the highest potential for wind power generation. In addition to wind, energy derived from the ocean’s tidal movements is another possible source. In fact, several states in the Southeast, including Georgia, already are looking into harnessing wind and ocean-based energy. One of the investments under consideration in Georgia is a regional transmission infrastructure for ocean-based renewable energy. The

Southern Company is also looking into utilizing the energy produced by Georgia’s coastal winds.

On the map of photovoltaic solar resources, most of Georgia’s counties south of the Augusta – Columbus line have the same potential supply of solar energy as northern Florida (down to Orlando) and Dallas, Texas, for example. These counties rank third on the 6-point scale of solar energy potential that was developed by the National Resources Defense Council. Most of the counties north of the Augusta – Columbus line, including the most populous areas of the state, have slightly less sunlight (about the same as South Carolina, southern Alabama, and Mississippi), and the solar energy

SOUTHERN SOLUTIONS FOR RENEWABLE ENERGY

Energy Source	Southeast (11 States)		Georgia	
	Potential Capacity (MW)	Percent of Total	Potential Capacity (MW)	Percent of Total
Onshore Wind	70,911	3.0	4,728	2.4
Offshore Wind	494,047	21.2	71,472	36.3
Biomass	92,906	4.0	12,175	6.2
Hydroelectric	63,274	2.7	4,066	2.1
Geothermal	1,058,703	45.5	39,018	19.8
Solar	545,476	23.5	65,187	33.1
Total	2,325,317	100.0	196,645	100.0

Source: Based on *Yes We can: Southern Solutions for a National Renewable Energy Standard*, Southern Alliance for Clean Energy.

Green Jobs

Wind Power

Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Truck Drivers, Construction Equipment Operators, Industrial Production Managers, First-Line Production Supervisors

Solar Power

Electrical Engineers, Machinery Mechanics, Electricians, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Construction Managers, Installation Helpers, Laborers

Biofuels

Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing/Blending Machine Operators, Agricultural Workers, Truck Drivers, Farm Product Purchasers, Ag/Forestry Supervisors, Agricultural Inspectors

potential steadily decreases towards the extreme northwest of the state. With the potential solar power capacity in most of Georgia estimated at 198 kWh/sq.ft. per year, this resource can be best utilized by photovoltaic rooftop products.

Compared to other southeastern states, Georgia has a plentiful supply of biomass. The triangle area formed by Appling, Glynn, and Ware counties, and several counties surrounding the Augusta MSA (Richmond, Burke, Warren, and Wilkes) have the highest potential to produce cellulosic biomass. In addition, most of the counties in north Georgia rank high in the potential for biogas recovery, which is energy retrieved from farm-generated animal waste.

Of course, the move towards renewable energy sources can only be realized with an updated national power grid. Although the new energy grid has recently become a part of the national economic policy, most of the new power lines will run through the West and Midwest. A proposed wind power transmission system, scheduled for completion by 2030, could run from Florida to north Georgia. A regional

Green Jobs

Smart Grid

Software Engineers, Electrical Engineers, Electrical Equipment Assemblers and Technicians, Machinists, Team Assemblers, Construction Laborers, Operating Engineers, Power Line Installers /Repairers

transmission infrastructure for ocean-based energy is also being studied in Georgia.

The updated “smart” power grid is likely to spark technological innovation not unlike the technological revolution of prior decades. Some see the smart grid as an “energy Internet” that will have the same transformative effect on the economy and individual households. The smart grid—able to transmit energy and data to and from distributed electricity generators and individual consumers—would change the way energy is generated, distributed, and used. In the long run, it would make electricity use more efficient, and limit the environmental impact of power generation.

Green Transportation

Georgians drive farther and spend more time commuting to work than the average American, and the state ranks fifth in the nation in the number of vehicle-miles traveled (according to 2006 data). While 35 percent of Americans have commutes of about 30 minutes, almost 40 percent of Georgians do. The time and money invested in the long commutes in Georgia create potential demand for alternative solutions in transportation and in living and working patterns.

The most recent census of population and housing in 2000 revealed a dramatic spread of suburbs far flung from city centers. This phenomenon is particularly common in the South, especially in Georgia (Atlanta) and Texas (Houston). One recent study revealed that households in remote suburbs use more electricity than those in more compact cities. In fact, in electricity usage, Houston and Atlanta rank first and second, respectively, among the largest metropolitan areas in the U.S. They also rank highest in CO₂ emissions. Atlanta itself produces more CO₂ emissions from driving than any other large metro area in the county.

Regulation of land use has provided mixed results: limiting sprawl in one area typically pushed it to other, even more remote areas where regulations were lax. Clearly, land use regulation alone is not the answer. If interest in conserving energy and cutting commuting time takes hold in Georgia, suburban households will become more energy efficient. Some even may use solar panels and wind turbines to generate their

own power, and sell it back to the grid. Those who choose to live in the suburbs probably will value fuel-efficient cars. New ideas for urban and suburban development and transportation also will come into play.

While wildly successful in attracting record numbers of new residents in the last decade, the next step towards economic success in Georgia will require assurances that quality of life measures up to the needs and aspirations of its citizens. The combination of mass transportation, fuel-efficient cars, clean fuels, thoughtful approach to land use, and efficient use of energy and water supplies will play an increasing role in achieving these goals.

Highway congestion and concerns over the water supply already sets limits to economic growth in the Atlanta area. For example, Atlanta—with its deep pool of entrepreneurial talent, world-class universities, hospitals, and the Centers for Disease Control and Prevention—has become a natural center for the life sciences industry. But the industry’s executives surveyed by the Selig Center between 2006 and 2008 singled out traffic congestion as the top infrastructure issue impacting their operations in Georgia. This is significant because, for most of these executives, the quality of life (separate from the cost of living) was the most important factor in locating their companies here.

Commuting to work is only one of the factors contributing to Georgia’s highway congestion. The state is a major transportation corridor, a gateway to Florida, and a recipient

Green Jobs

Mass Transit

Civil Engineers, Rail Track Layers, Electricians,
Welders, Metal Fabricators, Engine Assemblers,
Production Helpers, Bus Drivers,
First-Line Transportation Supervisors, Dispatchers

Energy-Efficient Cars

Software Engineers, Electrical Engineers,
Engineering Technicians, Welders, Transportation
Equipment Painters, Metal Fabricators,
Computer-Controlled Machine Operators,
Engine Assemblers, Production Helpers,
Operations Managers

Green Jobs Source: *Job Opportunities for the Green Economy*, Robert Pollin and Jeannette Wicks-Lim, Political Economy Research Institute, University of Massachusetts-Amherst, June 2008.

**Annual Reduction in Emissions and Energy Use
Resulting from Shift to High Speed Rail—
with HSR North of Charlotte, 2025**

							Energy
							Use
Emissions (kg)							(MBTU*)
Technology	VOC*	CO*	NOX*	SOX*	PTM*	CO2*	
HSR 90	9,099	203,000	-38,900	-6,300	558	5,243,000	88,280
HSR 110	9,904	222,600	10,770	-1,960	1,052	6,839,000	84,640
HSR 125D	11,760	280,700	-5,390	-4,770	750	7,073,000	95,910
HSR 150D	10,130	295,600	-54,100	-9,470	-1,010	4,450,000	93,680
HSR 150EL	16,930	313,900	71,890	-8,040	91	5,276,000	106,500
HSR 200EL	16,180	306,800	98,010	-11,000	-625	-6,800,000	-82,000

Most efficient scenario shaded in gray.
 *VOC, volatile organic compounds), CO (carbon monoxide), NOX (nitrous oxides), SOX (sulfur oxides), PTM (particulate matter), and CO2 (carbon dioxide), MBTU (One million of British Thermal Units)
 Source: The Volpe Center, Evaluation of High-Speed Rail Options in the Macon-Atlanta-Greenville-Charlotte Rail Corridor.

of worldwide traveler and shipments traffic coming through Georgia's ports and Hartsfield-Jackson International Airport in Atlanta. Interstate highways in and around Atlanta and Savannah are projected to remain some of the most congested interstates in the country. Moving more passengers and cargo by train would go a long way towards relieving traffic along Georgia's busiest interstates.

The proposed high-speed rail system to connect states along the eastern seaboard—with hubs in Atlanta, Macon, and Savannah—is designed to save time and money by facilitating passenger traffic and easing highway congestion. It will also reduce air pollution.

Although Georgia is included on the map of the proposed improvement to the national railroad infrastructure, other states in the region, especially North Carolina, are more advanced in their planning for a high-speed train, and therefore more likely to take advantage of funds allotted to this project. Nevertheless, in 2008, the Georgia Department of Transportation commissioned a study on the feasibility of constructing a high-speed rail line to link Macon and Atlanta with Charlotte, North Carolina. The study outlines the cost of construction, operation, and maintenance of the line, projects its ridership, and concludes that investors can expect to break even by 2032.

The study also assesses the social impact of the high-speed rail, expressed in terms of "consumer surplus" and reduced air pollution. In the most efficient scenario, the consumer surplus—or time and cost savings produced by the proposed rail line—ranges from \$1.2 million to \$17.6 million. In addition, high-speed rail between Macon and Charlotte is projected to reduce energy use of 93,680 to 95,910 MBTU in 2025, which is equivalent to the total annual energy use of 285 Georgians in 2006. The high-speed rail would cut the

emissions of volatile organic compounds, carbon monoxide, and carbon dioxide, although the emission of nitrous and sulfur oxides would increase.

Green Buying Power

Consumers' interest in buying green, regardless of whether or not it make economic sense at the moment, is an important factor in the green economy. The power of conviction, social pressure, and even a fad, translates into real money in consumer choices, as is evident in the rise of health food stores, increased interest in local and organic farming, popularity of hybrid cars, and energy-efficient lighting, for example. People also are showing renewed interest in in-town neighborhoods where shopping and entertainment are within walking distance.

The growing concern over energy and environmental issues was reflected in the 2006 Pew Research Center survey in which 58 percent of respondents identified energy issues as their top priority concern, compared to 40 percent who said so in 2003. Similarly, 57 percent of respondents said the environment was their top concern, up from the 39 percent who indicated it three years previously.

Making the shift from being one of the most intensive energy using regions in the country towards energy efficiency and conservation will require investment and effort. The investment in utilizing local resources will produce local jobs and improve prospects for economic growth, however. With natural resources favorable to biofuels production, organic agriculture, and the harnessing of wind, ocean, and solar energy, Georgia is well positioned to make the green industries a vital part of its economy.

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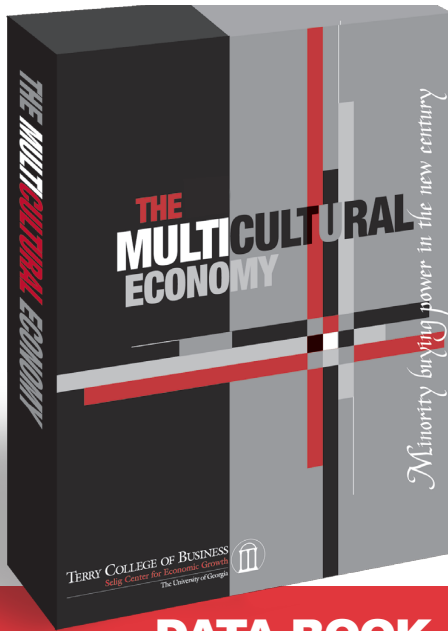
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