



## 2012 GEORGIA ENERGY REPORT

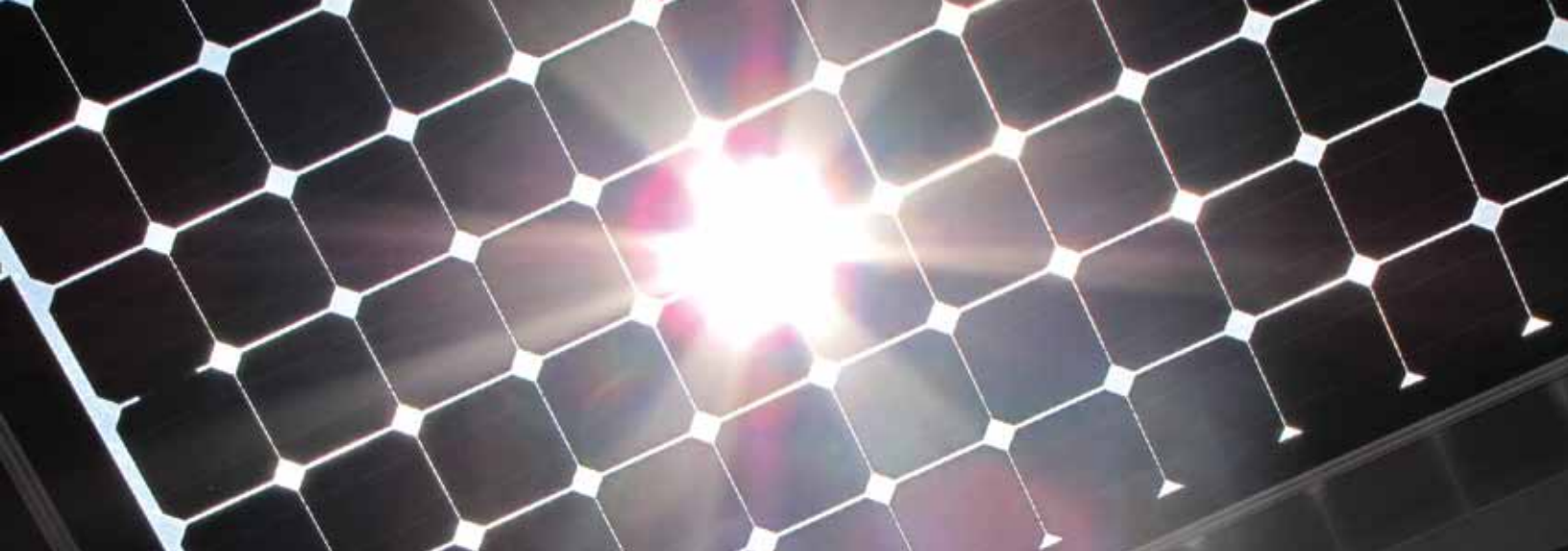




## 2012 GEORGIA ENERGY REPORT

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## EXECUTIVE SUMMARY

**The 2012 Georgia Energy Report** contains a state energy profile and an inventory of the actions Georgia has taken to implement the 2006 State Energy Strategy (SES) and the 2009 State Energy Strategy Update. Georgia has made significant strides since former Gov. Perdue first commissioned the State Energy Strategy in 2006. Since 2009, 11,404 homes were weatherized in Georgia, 4,822 residents and organizations committed to take the Georgia Energy Challenge (GEC) and reduce energy consumption, the State Energy Program (SEP) provided \$65 million to state facilities for energy efficiency retrofits and more than \$21 million was offered through the Energy Efficiency and Conservation Block Grant (EECBG) program. These are just a handful of the accomplishments since the 2009 State Energy Strategy Update.

There is still more work to be done, however, by the state, as well as residents, businesses and other organizations to ensure Georgia has adequate energy resources in the future. Meeting Georgia's future energy needs and ensuring proper conservation and preservation of energy and environmental resources requires that everyone in the state do their part to conserve resources and support resource development.

The Georgia Environmental Finance Authority (GEFA) is taking a leadership role in energy conservation in the state, from developing the State Energy Strategy to creating and implementing innovative programs to protect and develop resources.



Georgia has experienced strong population growth and economic development for decades. Progress has provided tremendous benefits for both residents and businesses, but it also brings new opportunities and challenges that must be addressed in order for Georgia to remain economically competitive in the Southeast. Planning for the state's future energy and environmental needs is a key component to a continued bright future. The 2012 Georgia Energy Report highlights Georgia's changing energy profile, as well as current and future energy and environmental programs and needs designed to benefit the entire state.

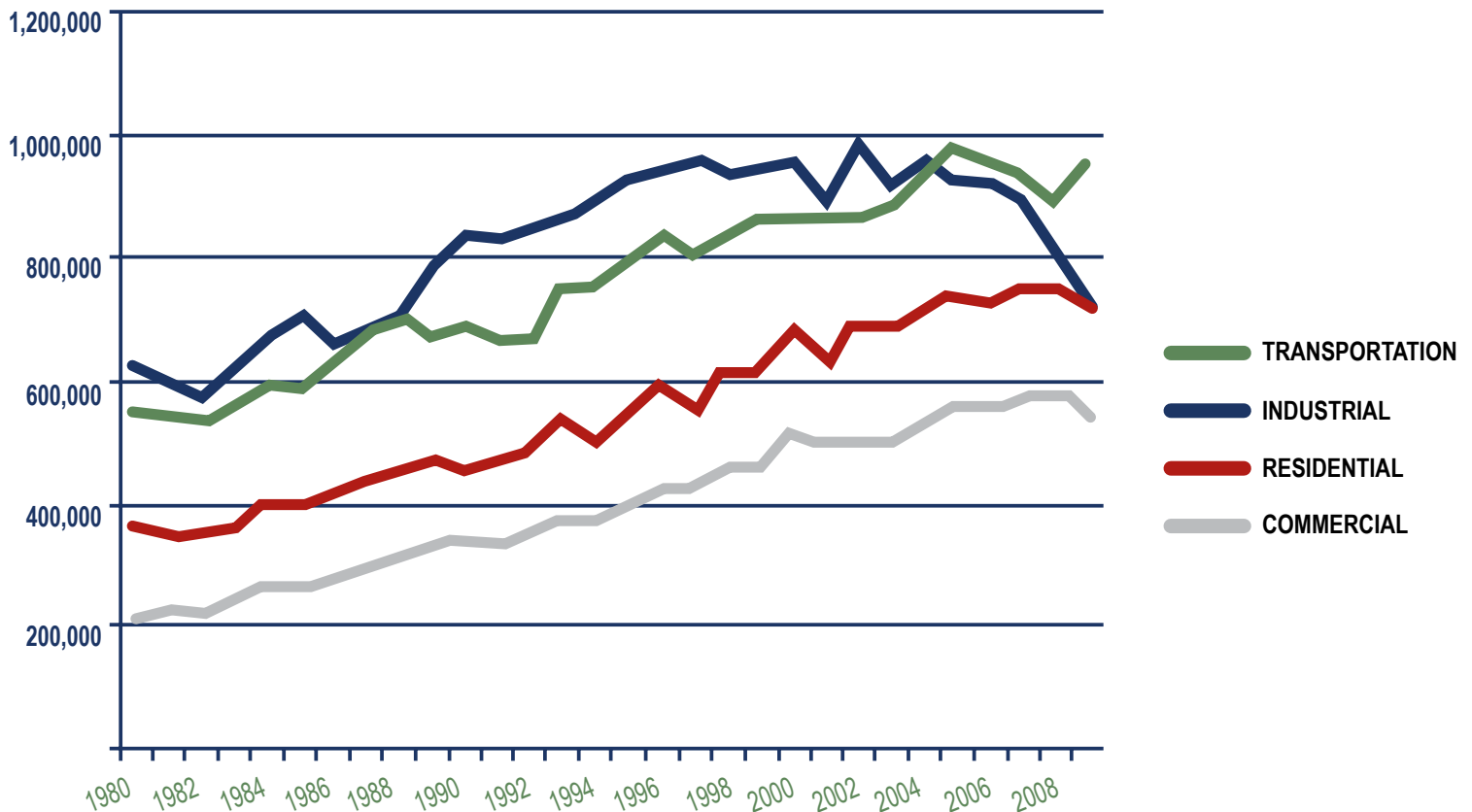


Georgia was one of the fastest growing states during the 20th century and the trend has continued into the first decade of the 21st century. Between 2000 and 2010, Georgia was the seventh fastest-growing state in the U.S., adding 18.3 percent more people than the previous decade and bringing the total state population to 9,687,653. The recession that began in 2008 added some uncertainty to future population increases and economic development in Georgia, but trends still suggest that Georgia will remain a high-growth state, thus increasing the need to plan now for Georgia's future energy needs. The Georgia Office of Planning and Budget (OPB) estimates that by 2020, Georgia's population will increase to nearly 12.2 million people.

## ENERGY CONSUMPTION BY SECTOR

Since 2005, the transportation sector has been the largest energy consumer in the state<sup>1</sup>. Prior to 2005, the industrial sector was the largest energy user in Georgia. In 2009, the year with the most recent U.S. Energy Information Administration (EIA) data available<sup>2</sup>, transportation consumed 952,900 billion British thermal units (Btus) of energy, followed by 723,200 billion Btus in the residential sector, 720,000 billion Btus in the industrial sector and 553,300 billion Btus in the commercial sector. It is worth noting that energy consumption in the industrial sector started decreasing in 2001, and generally decreased through 2009. The decrease in industrial consumption is likely explained by a few factors, occurring both in Georgia and the U.S.: a decrease in the amount of industrial economic activity; efficiency gains; and the recessions that began in 2001 and 2008. The decrease in transportation-related energy consumption after 2005 is likely explained by increases in automobile efficiency, as well as the beginning of the economic downturn in 2008.

GEORGIA TOTAL ENERGY CONSUMPTION BY SECTOR (BILLION BTUS)



<sup>1</sup>The electric power sector in Georgia is the number one consumer of energy; however, the energy consumed by the electric power sector in Georgia is not included in the above graph. This is because energy consumed by the electric power sector includes energy used for the generation and delivery of electricity to the point of use plus the energy consumed by the electric power sector itself.

<sup>2</sup>Unless otherwise noted, the energy data cited in this document comes from the U.S. Energy Information Administration, the independent statistical and analytical agency of the U.S. Department of Energy. The EIA is considered one of the most reliable sources of energy information around the globe.





## ENERGY ASSURANCE

The state is currently working on a number of initiatives in coordination with utilities and energy companies to improve Georgia's ability to prepare for and respond to a variety of energy emergencies and supply disruptions. Georgia received funding to perform this work through the U.S. Department of Energy's (DOE) "Enhancing State Government Energy Assurance Capabilities and Planning for Smart Grid Resiliency" grant.

Energy assurance planning helps to provide Georgia with a resilient, robust and secure energy supply. Energy assurance in Georgia encompasses a number of energy topics, including electric power generation, transmission, and distribution, petroleum and natural gas delivery and distribution, as well as the development of smart grid technology, renewable energy generation, cyber security and critical infrastructure protection.

Georgia is especially vulnerable to energy supply disruptions because the state imports almost all of its energy needs. Georgia's energy vulnerability is driving GEFA, along with the Georgia Emergency Management Agency (GEMA) through a strategic partnership, to not only meet DOE's grant requirements but to exceed them. When complete, Georgia will have a thorough and well-tested energy assurance plan along with an advanced geographic information system and supply disruption tracking analysis tool, which is named the Georgia Online Disaster Awareness Geospatial System. This geospatial visualization tool and disruption tracking system integrates unconnected data sources for easier analysis, organization and sharing of information. The integration of emergency management software into the online geospatial system will give emergency responders and disaster planning partners a way to spatially track critical incidents, including energy emergencies. This integration will benefit state energy providers and responders before and after emergencies by enabling users to share information and improve incident response decision-making.

## PETROLEUM

In 2009, Georgia consumed 8.2 billion gallons of petroleum products, of which 4.9 billion gallons was motor gasoline. Georgia imports all of its petroleum products. The majority of the petroleum products enter the state via two pipelines, the Colonial and Plantation pipelines, which originate from the Gulf Coast. Petroleum also enters the state through the ports of Savannah and Brunswick. Due to dependency on petroleum imports, Georgia's supply of petroleum is vulnerable to extreme weather and human-related interruptions. Notably, many experts and energy companies expect petroleum demand to level off in the U.S. going forward due to significant efficiency gains. However, population growth in Georgia might still mean increased petroleum demand.



## COAL

In Georgia, coal demand is driven by the electric power sector. In 2009, Georgia consumed 33.8 million short tons of coal, or the equivalent of 67.7 billion pounds. More than 96 percent of this was used in the electric power sector.

Georgia imports all of its coal, with the majority coming from within the U.S. In 2009, 45 percent of coal consumed in Georgia originated in Kentucky, while nearly 38 percent came from Wyoming. Nearly all coal arrives in Georgia via railroad. Demand for Wyoming coal is growing because the coal is subbituminous (lower in ash and sulfur than Appalachian-mined coal), and frequently meets U.S. Environmental Protection Agency (EPA) compliance regulations compared to coal from Appalachia. However, it is important to note that coal from Wyoming is less energy dense than coal from Appalachia, which requires burning more to produce the same amount of energy. This means potential future carbon regulations could change the mix required by utilities in Georgia.

## NATURAL GAS

Natural gas is the third most used fuel in Georgia, after petroleum and coal, respectively. In 2009, Georgia consumed 475.4 trillion Btus of natural gas, or the equivalent of 463 billion cubic feet (Bcf). Nearly one-half (46 percent) of Georgia households use natural gas as its main source for home heating, cooking and hot water. While the residential and industrial sectors are the largest users of natural gas in Georgia, electric power generation used about 23 percent of all natural gas in Georgia in 2009. Electric power generation is expected to consume a significant amount of natural gas in the near future due to a number of factors, including dramatically increasing natural gas reserves in the U.S. resulting in lower prices, as well as pressure for cleaner and lower emission electric generation. Potential future carbon legislation and EPA regulations have the potential to increase electric utility natural gas demand greatly.

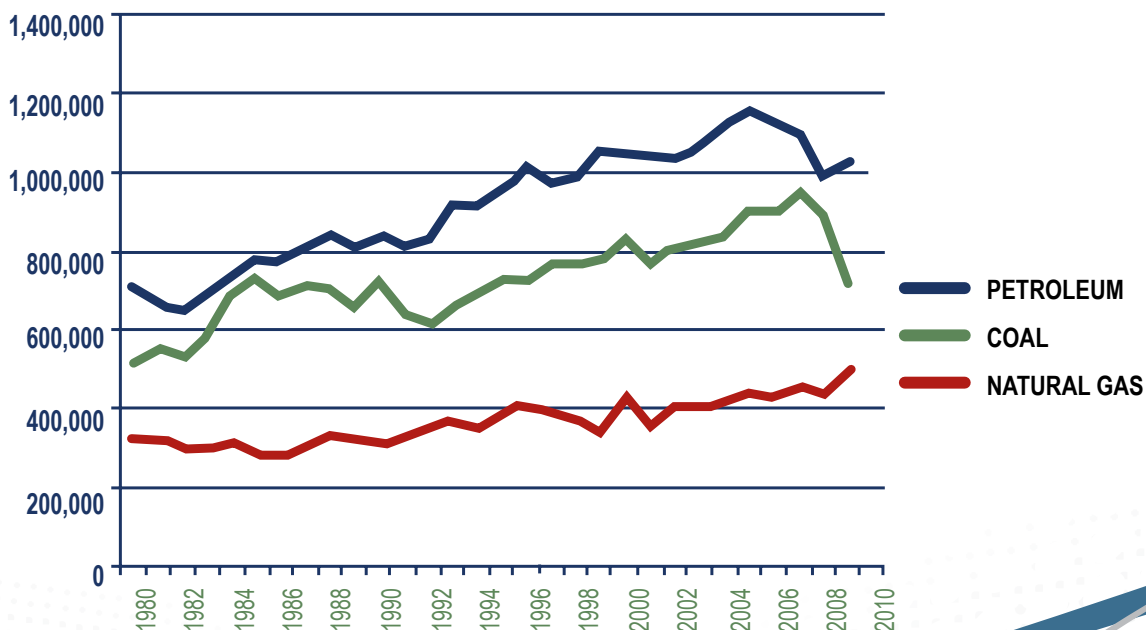
Similar to petroleum, Georgia has no proven reserves of natural gas and is largely dependent upon interstate pipelines for natural gas delivery. Fortunately, Georgia also has access to liquefied natural gas (LNG) imports through the Elba Island Terminal near Savannah.

## RENEWABLE ENERGY

Georgia, like much of the U.S., is seeing an increase in demand for renewable energy<sup>3</sup>. Renewable energy in Georgia is mostly used for electricity production and transportation fuels. The vast majority of renewable electricity production in Georgia comes from conventional hydroelectric and wood and wood waste biomass. However, expanding sources in Georgia that are likely to be more significant in the future include solar, landfill gas and offshore wind.

In 2009, Georgia generated 6.1 million MWh of renewable electricity, representing approximately 4.7 percent of all electric-power generation. About 45 percent of renewable electricity was generated by wood and wood waste biomass, while 54 percent was generated by conventional hydroelectric. See the sidebar on bioenergy on page 16 for more information.

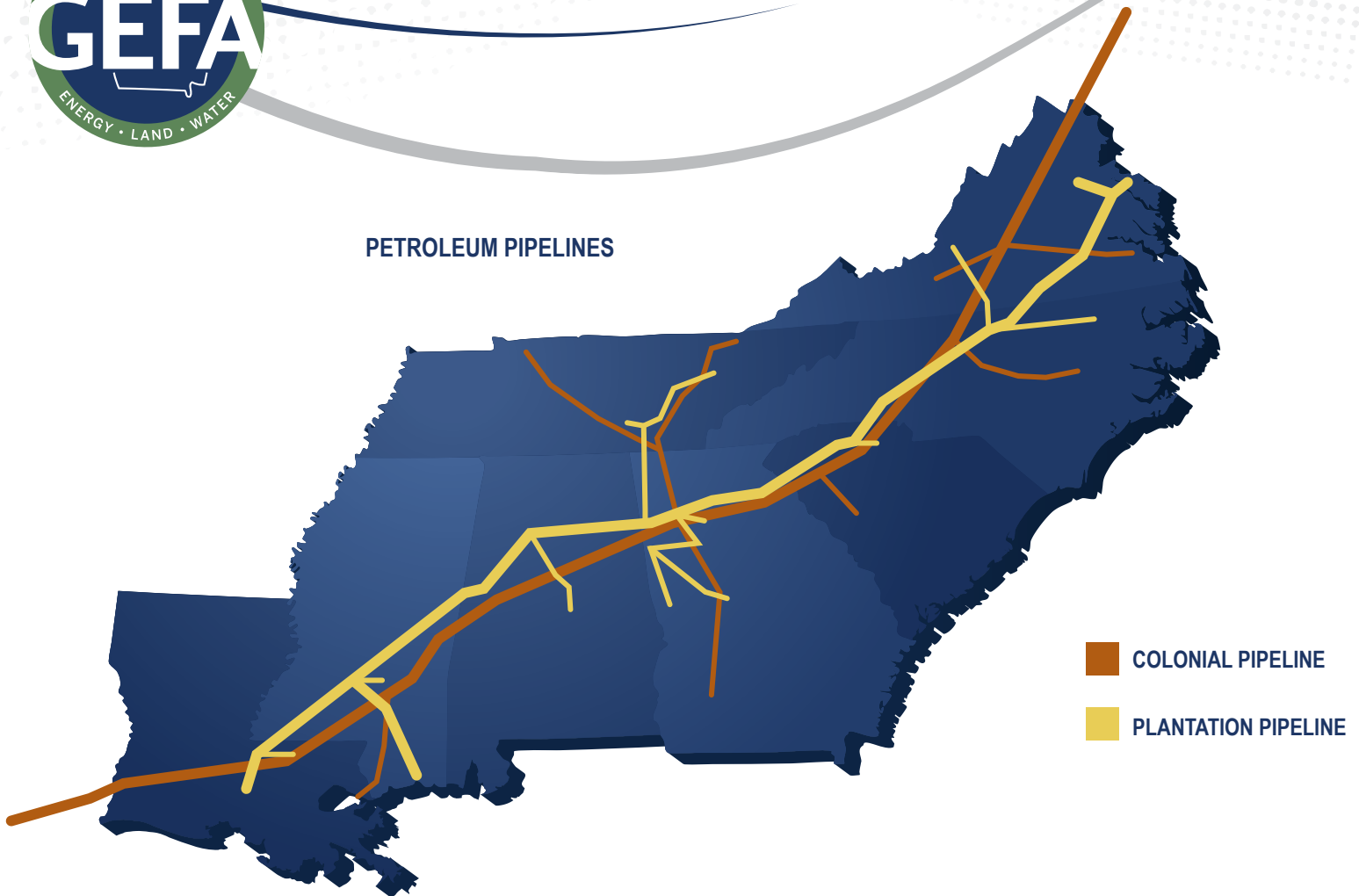
### FOSSIL FUEL CONSUMPTION BY TYPE (BILLION BTUS)



<sup>3</sup>Renewable energy is energy obtained from sources that are inexhaustible. Renewable sources of energy in Georgia include conventional hydroelectric power, geothermal, solar, wind and biomass.



## PETROLEUM PIPELINES



## WHERE DOES GEORGIA'S PETROLEUM AND NATURAL GAS COME FROM?

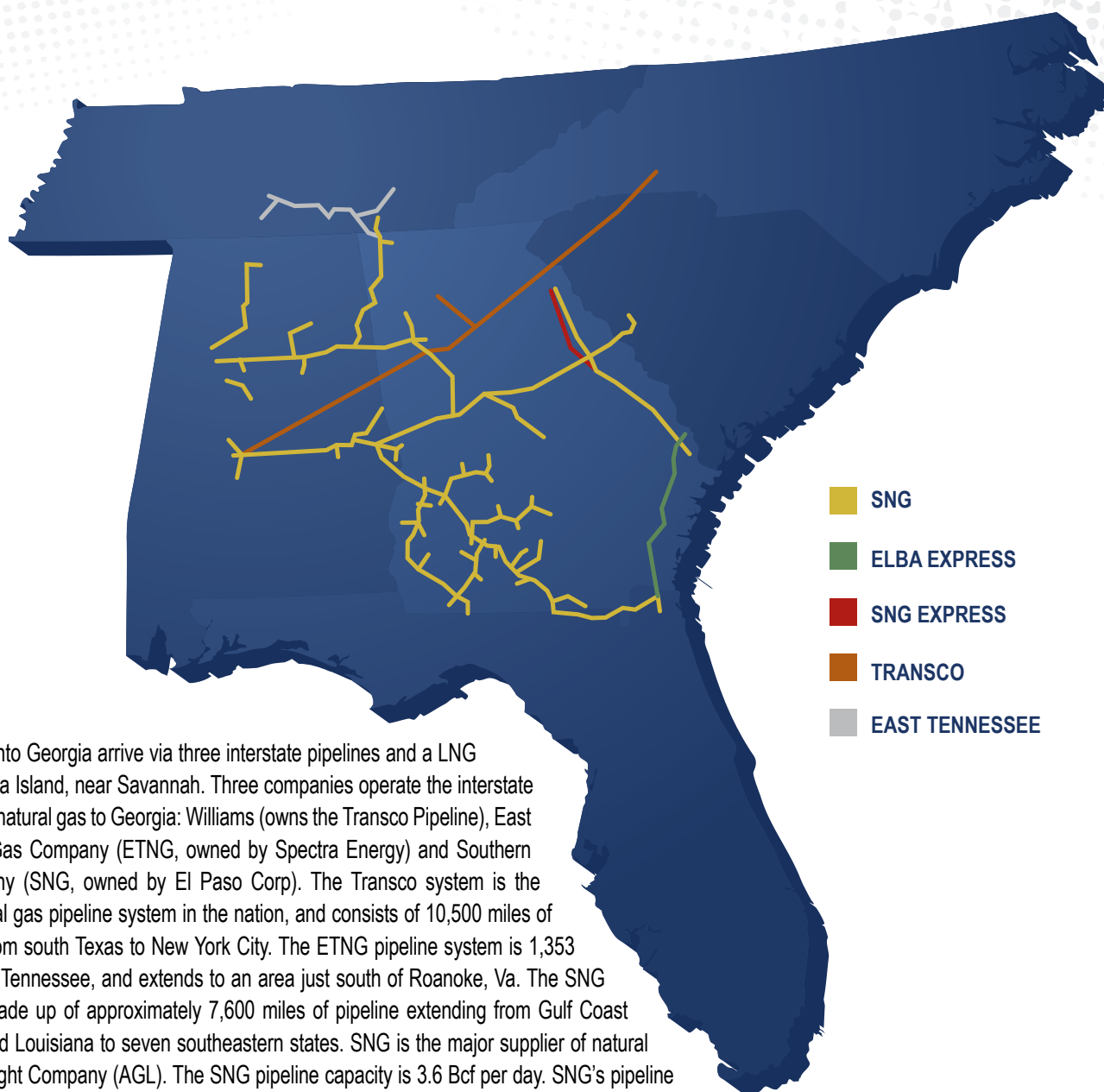
Georgia is reliant on imported refined petroleum products to meet its demand. Most refined petroleum imports come into the state via two interstate pipelines: Colonial Pipeline and Plantation Pipeline. The Colonial Pipeline system spans 3,500 miles with 5,100 miles of pipe (some of the right away contains more than one line) from Texas to New Jersey, providing refined petroleum products to Louisiana, Mississippi, Alabama, Georgia, Tennessee, South Carolina, North Carolina, Virginia, Maryland, New Jersey, New York, Pennsylvania and Delaware. The Plantation Pipeline system receives petroleum products from nine refineries in Mississippi and Louisiana and delivers those products to 130 shipper terminals in eight states through a 3,100 mile network of pipeline. The states served by the Plantation Pipeline include Louisiana, Mississippi, Alabama, Georgia, Tennessee, South Carolina, North Carolina and Virginia.

The supply of transportation fuels and other refined petroleum products involves not only the supply of crude oil through the global oil market, but also the capacity to refine crude oil into fuels. While refineries are spread throughout the U.S., the greatest concentration of refining capacity is located along the Gulf Coast in Texas, Louisiana and Mississippi. Georgia relies almost entirely on the refining capacity in the Gulf Coast.

The petroleum industry in Georgia includes major companies that import fuel, as well as wholesale and retail distributors, including service stations and fuel oil and propane distributors. While the bulk of the oil products come to the state via the Colonial and Plantation pipelines, propane is received via the Dixie Pipeline. Some product is also imported by tanker and off loaded at ports in Brunswick and Savannah. Petroleum products delivered to Georgia are usually received at terminals and trucked to local distribution points. The petroleum product terminals serving Georgia are located in Albany; Americus; Athens; Bainbridge; Doraville (the largest); Griffin; Macon; Rome; Chattanooga, Tenn.; and Jacksonville, Fla.



## NATURAL GAS PIPELINES



Natural gas imports into Georgia arrive via three interstate pipelines and a LNG import terminal at Elba Island, near Savannah. Three companies operate the interstate pipelines that deliver natural gas to Georgia: Williams (owns the Transco Pipeline), East Tennessee Natural Gas Company (ETNG, owned by Spectra Energy) and Southern Natural Gas Company (SNG, owned by El Paso Corp). The Transco system is the second largest natural gas pipeline system in the nation, and consists of 10,500 miles of pipeline extending from south Texas to New York City. The ETNG pipeline system is 1,353 miles long, begins in Tennessee, and extends to an area just south of Roanoke, Va. The SNG pipeline system is made up of approximately 7,600 miles of pipeline extending from Gulf Coast locations in Texas and Louisiana to seven southeastern states. SNG is the major supplier of natural gas to Atlanta Gas Light Company (AGL). The SNG pipeline capacity is 3.6 Bcf per day. SNG's pipeline delivers gas at 165 delivery points in Georgia, including 131 local distribution companies or municipal gas utility delivery points, 22 direct industrial customers and 12 power generation facilities. Even though Georgia has no underground natural gas storage, AGL owns and operates three LNG peak-shaving facilities in Georgia. AGL's largest facility is the Riverdale LNG plant, which has a storage capacity of 2,560 Bcf and is connected to two interstate pipelines for supply. The Riverdale plant is also connected to the AGL beltline pipeline system for distribution of natural gas into the Atlanta market and has a peak send-out of 400 Bcf per day. AGL's Cherokee LNG plant, located in Ball Ground, Ga., has approximately 2,020 Bcf in a storage capacity. The plant receives natural gas from three pipelines and has a peak send-out of 400 Bcf per day. Like the Riverdale plant, the Cherokee plant also serves the Atlanta market. AGL's Macon, GA., LNG plant has a storage capacity of almost 1,502 Bcf and has a peak send-out of 150 Bcf per day. However, the plant's pipeline system can only accommodate a delivery of 70 Bcf per day.

AGL completed a new pipeline in November 2009 to supply 83,722 dekatherms a day of new capacity to the state. The Magnolia pipeline delivers enough natural gas to fuel 250,000 Georgia homes. The pipeline connects the Elba Island LNG facility directly to AGL's Brunswick and Macon service territories and establishes new deliverability to Atlanta.



## ELECTRICITY

In 2009, Georgia had a net summer electric generation capacity of 36,549 MW<sup>4</sup>, which represents 3.6 percent of the total electric generation capacity of the U.S. Coal generation makes up the majority of capacity in Georgia, at 36.2 percent, with natural gas closely following at 34.8 percent. Fuel sources for electric power generation have fluctuated in recent years due to environmental regulations and fuel price fluctuations, while natural gas as a fuel for electric power generation has surged. In 1990, natural gas made up a mere 7.8 percent of Georgia's net summer generation capacity, significantly less than the 34.8 percent in 2009. New pollution controls and the falling price of natural gas will increase its importance to the state.

The type of fuel used to generate electricity depends on many factors, including demand, the time of day, the season and the weather. Electric providers must be ready to meet the electricity demands of their customers at all times of the day, despite storage challenges. Electricity generation is usually divided into three categories: baseload (generation run 24 hours of the day), intermediate (usually run from mid-morning until the evening), and peak load (run when demand is highest – usually in the afternoon and early evening).

Each type of fuel used to generate electricity has specific operating and cost characteristics that determine during which load category the fuel will be used to generate electricity. Baseload demand is usually satisfied by nuclear and coal generators (due to their low variable costs and limited operational flexibility – i.e., it takes time for the generators to warm up), biomass and some hydroelectric generation (due to low variable costs). Intermediate loads are often satisfied by gas and oil steam turbines, combined cycle gas turbines and hydroelectric power. These are used because the operational flexibility allows them to be ramped up and down as loads rise and fall during the day, and because their variable costs are lower than other options. Peak loads are usually satisfied by single-cycle gas turbines, hydroelectric power, pumped hydroelectric power and solar-generating units. It is important to note that while fuels such as natural gas, petroleum, and renewables make up a significant percent of net summer capacity, they are not responsible for a high percentage of actual year round generation due to primarily being used for intermediate and peak loads, as opposed to 24/7 baseloads.

<sup>4</sup>Capacity is the maximum electric power output of a generating unit and net summer capacity is the maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to a system load, as demonstrated by a multi-hour test, adjusted to ambient weather conditions for summer peak demand.

## GEORGIA POWER

Georgia law (O.C.G.A. § 46-3A-1) requires that every three years Georgia Power submit an Integrated Resource Plan (IRP) to the Public Service Commission (PSC). The IRP includes Georgia Power's projections for its customers' demand, but also details how Georgia Power intends to meet those demands over the next 20 years through power plants, efficiency and conservation. Georgia Power's most recent IRP was approved by the PSC in 2010.

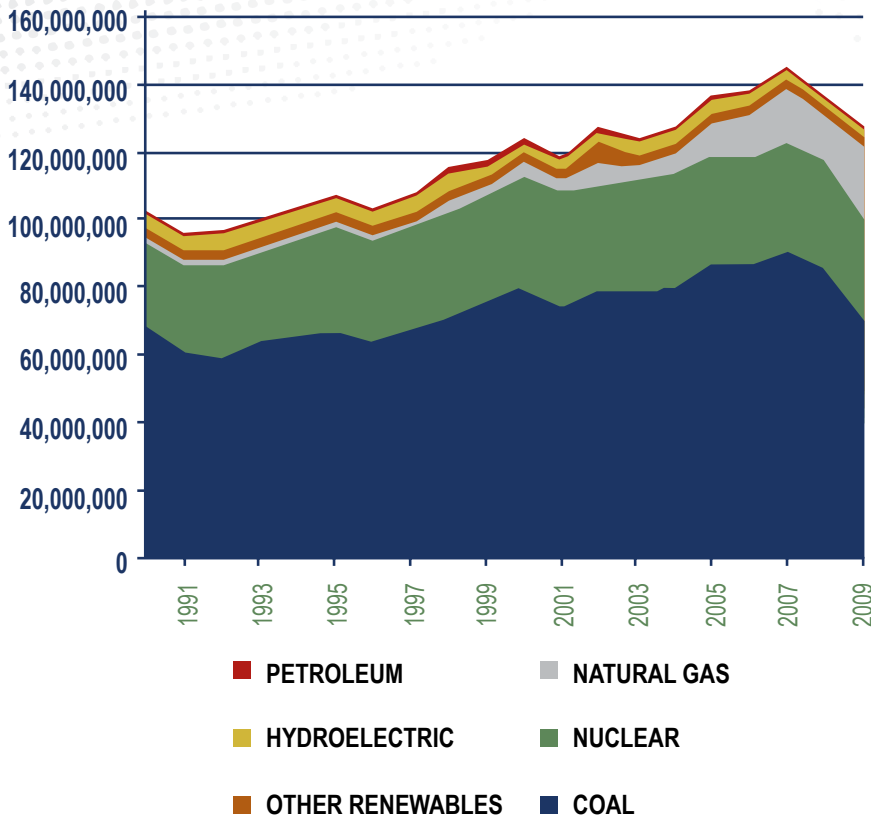
The IRP Act gives the PSC the authority to review, modify, reject or approve a plan for meeting future energy demands prior to any commitment to construct a facility, contract for purchase power or implement a demand-side resource. The IRP process dictates that Georgia Power develop the resources that prove the most cost-effective in meeting Georgia's energy needs. In requiring Georgia Power to evaluate demand-side management programs (DSM) as a resource for meeting their forecasted loads, the IRP compels Georgia Power to also use energy efficiency as a cost-effective way to meet future demand instead of only building new power plants.

Notable developments in Georgia Power's approved 2010 IRP include the construction of a one MW solar photovoltaic (PV) demonstration facility and the approval of nine DSM programs. The nine DSM programs includes these focus areas: residential lighting and appliance, residential existing homes, residential high-efficiency new homes, residential refrigerator recycling, residential water heating, commercial audits, commercial custom incentives, commercial prescriptive incentive and industrial audits. Georgia Power is also required to file a new energy efficiency potential study one year ahead of the 2013 IRP.

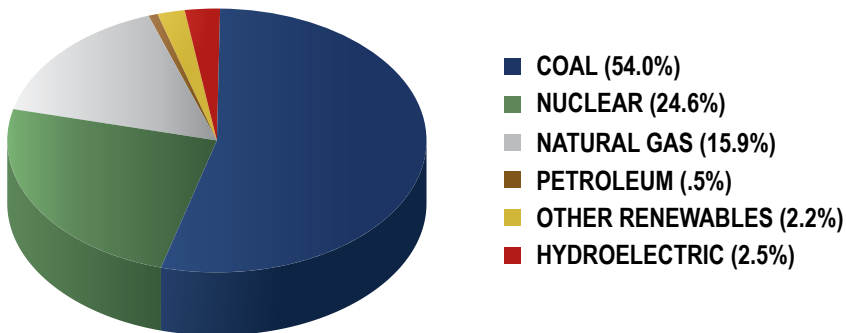
## MEAG POWER

MEAG Power also conducts long range demand and supply planning in order to meet future customer needs. Once forecasts are in place and determinations are made as to whether to meet demand with base, intermediate or peaking generation, the MEAG Power board of directors directs staff on the lowest cost reliable option for filling that need. Options include construction, purchase or leasing the appropriate generation resource. Energy efficiency and renewable energy are also considered in MEAG Power's planning process, in addition to conventional generation.

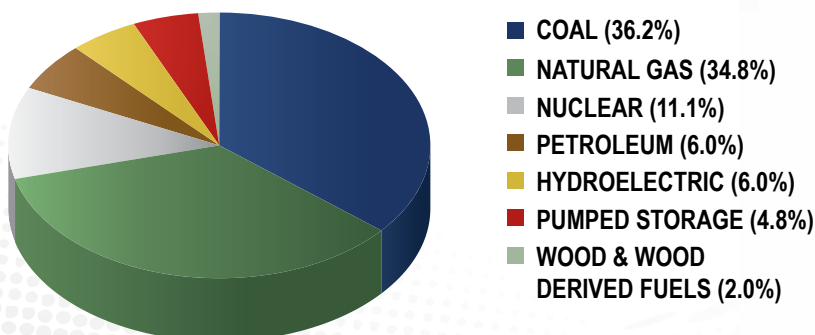
## ELECTRIC GENERATION BY FUEL TYPE (MWH)



## ELECTRIC GENERATION BY FUEL TYPE, 2009



## ELECTRIC NET SUMMER CAPACITY, 2009



## OGLETHORPE POWER AND THE ELECTRIC MEMBERSHIP CORPORATIONS

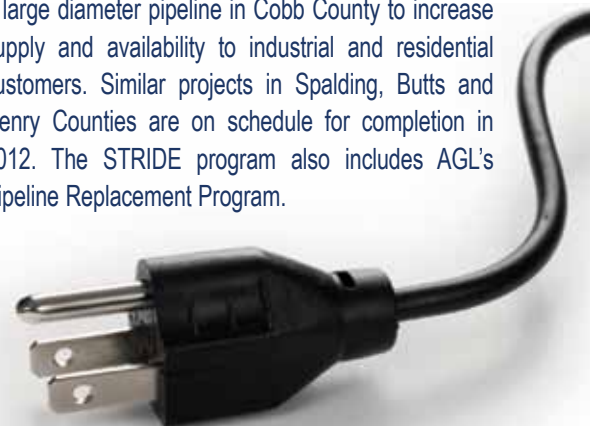
Oglethorpe Power (OPC) conducts an annual planning process that results in a menu of power supply options for its 39 Member System Electric Membership Corporations (EMCs). It begins with each EMC independently forecasting their projected growth over a 10 year period. In this process, the EMCs consider energy efficiency, DSM, and other inputs including economic forecasts. OPC then aggregates all of the EMC forecasts to determine the overall system power supply needs including when it is needed and whether it is base, intermediate or peaking.

Each EMC has a number of options that result from the planning process: OPC can build new resources, OPC can acquire existing resources, EMCs can contract with third-party power suppliers, EMCs can build resources, EMCs can purchase from the marketplace, EMCs can contract with Green Power EMC for renewable resources, or EMCs can utilize a combination of the above options to meet their needs. The Official Load Forecast is approved annually by the OPC board of directors.

Note: The three EMCs in North Georgia served by the Tennessee Valley Authority (TVA) are included in TVA's planning process.

## ATLANTA GAS LIGHT

In addition to electric utility demand forecasting, Atlanta Gas Light (AGL) began a triennial study of its infrastructure and ability to serve customers on a design or peak day. This process, known as STRIDE (strategic infrastructure design and enhancement) was approved by the PSC in 2009. While STRIDE is focused on ensuring AGL has adequate pipeline infrastructure to move gas demanded across its footprint, the program also includes an economic development pilot program aimed at extending distribution facilities to areas of the state where natural gas is unavailable. As a part of STRIDE, AGL added a large diameter pipeline in Cobb County to increase supply and availability to industrial and residential customers. Similar projects in Spalding, Butts and Henry Counties are on schedule for completion in 2012. The STRIDE program also includes AGL's Pipeline Replacement Program.







## NEW ENERGY PROGRAMS

The American Recovery and Reinvestment Act of 2009 (ARRA) is providing funding to new and existing opportunities for energy projects and clean energy technology in the state of Georgia. A total of \$239,763,706 of ARRA funding is dedicated to energy related programs through GEFA. The funding breakdown, per program:

State Energy Program	\$82,495,000
Weatherization	\$124,756,312
Energy Efficiency & Conservation Block Grant	\$21,630,700
Appliance Rebate Program	\$9,293,000
Save Energy Now	\$500,000
Energy Assurance	\$1,088,694
<b>TOTAL</b>	<b>\$239,763,706</b>

### NEW ENERGY PROGRAMS INCLUDE:

**Energy Efficiency and Conservation Block Grant Program (EECBG):** Authorized by the Energy Independence and Security Act of 2007, EECBG was funded for the first time by ARRA. Georgia received \$21.6 million, much of which has been allocated to local governments for efficiency and renewable energy projects, as well as utility on-bill financing and the Georgia Cities Foundation. Fourteen solar projects have been funded as a result of EECBG funds.

**Clean Energy Property Rebate Program:** Georgia received \$4.5 million to fund a portion of the cost of installing renewable energy property or implementing lighting retrofits or building-efficiency upgrades. The program offsets up to 35 percent of the installation costs. The Clean Energy Property Rebate Program is for non-residential purposes only. The 19 solar photovoltaic (PV) installations as a result of the Clean Energy Property Rebates are estimated to generate 2130 kW, or enough electricity to power 1,598 homes.

**Renewable Energy Grants:** The Renewable Energy Grants Program seeks to fund market transformation activities in renewable energy, including wind, solar PV, and solar hot-water heating. Georgia received \$4 million for this program and the grants were made on a competitive basis. A total of five grants were awarded, which include 34 solar PV installations, 13 solar hot water projects and one wind installation.

**Energy Efficiency Grants:** Through the SEP, Georgia provided \$6 million in energy efficiency grants, with \$2 million dedicated to the industrial, commercial and residential sectors. These grants were given on a competitive basis.

**State Energy Efficient Appliance Rebate Program (SEEARP):** Georgia's SEEARP provided more than \$9 million in funding through the SEEARP. SEEARP was used for rebates to residents who purchased approved ENERGY STAR compliant appliances. In Georgia, more than 114,000 rebates for appliances were approved.



**Save Energy Now:** The Save Energy Now program supports the Southeast Industrial Energy Alliance, which is a collaboration of states, the Oak Ridge National Laboratory, the DOE, the Georgia Institute of Technology (Georgia Tech), utility companies and manufacturers. Recruited industry clients will participate in a pilot program that provides American Society of Mechanical Engineers energy assessments and American National Standards Institute plant certification programs. This will result in industrial energy savings and increased expertise within the state.

**Energy Assurance:** Georgia is working on a number of energy-assurance related activities under the Enhancing State Government Energy Assurance Capabilities and Planning for Smart Grid Resiliency grant. See the energy assurance sidebar on page 5 for more information.

**Existing energy programs that received additional funding through ARRA:**

**The State Utilities Program (SUP):** The SUP is working with \$65 million in funds from the SEP to provide energy efficient retrofits for state government facilities. As a result, 135 different energy conservation measures are being implemented in facilities across the state, which will help the state meet its goals under the Georgia Energy Challenge.

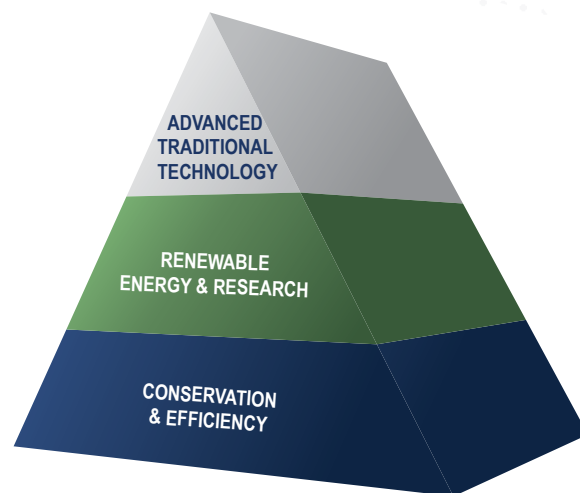
**The Weatherization Assistance Program (WAP):** The WAP received nearly \$125 million in ARRA funds. WAP utilized ARRA funds to weatherize 11,404 homes in Georgia since 2009. Additionally, WAP has trained 844 people to weatherize homes.

## STATE ENERGY STRATEGY BACKGROUND & UPDATE PROCESS

In February 2006, former Gov. Perdue directed GEFA to lead an inclusive, statewide stakeholder process to develop the first comprehensive State Energy Strategy for Georgia. In December 2006, the Governor's Energy Policy Council submitted the SES to former Gov. Perdue, which provided a menu of policy options for the state to consider. Given the rapidly changing world of energy supply and demand, it is important that the state review the implementation of the SES regularly and update the analysis and policy objectives to reflect changing energy trends.

The SES recommendations prioritized the existing options available to meet the state's energy needs, using increased energy efficiency and conservation as a base. The second priority is the use of renewable resources and the third priority advocates advanced coal, gas, and nuclear technologies. Georgia's SES recognizes the need for a combination of all resources with the assumption that no single resource can or will be sufficient to meet our future energy needs in an environmentally responsible and economical way.

In 2009, GEFA released the first update to the SES, which included updated energy supply and demand data, changes in policy and implementation, and changes in energy resources and initiatives in Georgia. The 2012 Georgia Energy Report seeks to continue this updating process, but also to highlight significant new and changing energy programs in Georgia since the 2009 update.



## GEORGIA CENTER OF INNOVATION FOR ENERGY

The Center of Innovation for Energy (COI-Energy) is one of six Centers of Innovation that provide technology-oriented support to businesses and start-ups in the state. Within this framework, the Centers create a pro-growth, innovative business environment. Established in April 2008 by former Gov. Perdue, the COI-Energy's goal is to attract and grow clean energy businesses, and promote the state's natural and economic resources. It accomplishes this by connecting potentially high-growth companies to university and technical college research, commercialization resources, technology connections, potential funding sources and key government agencies. COI-Energy's director and staff have industry-specific knowledge regarding energy alternatives, including gas, electric, solar, biofuels and biomass.

The COI-Energy is based in Atlanta at the Georgia Department of Economic Development (GDEcD). COI-Energy has strong partnerships with the University System of Georgia and the Herty Advanced Materials Development Center. Its Bioenergy One Stop Shop brings these clean energy businesses together with representatives from more than 20 state and federal agencies. Companies are given the opportunity to present their bioenergy projects and leave with materials to accelerate their start-up or growth process by up to 12 months.



## ENERGY SAVINGS PERFORMANCE CONTRACTING

Energy Savings Performance Contracting uses a competitive bid process to select a qualified firm to identify, recommend and install energy-efficiency and conservation measures in state-owned facilities. The firm selected guarantees results from the installed measures. This guarantee is the basis for financing the improvements, resulting in lower utility bills, reduced energy consumption and more modern and efficient energy equipment at no net cost to the state. As a tool, energy savings performance contracting has existed since the 1970s, and is widely used by many states and the federal government. Until approval by voters on November 2, 2010, Georgia was unable to use this tool due to language in the state constitution. However, voters approved a constitutional amendment permitting performance contracting by an overwhelming margin, which authorized statutory approval for the Guaranteed Energy Savings Performance Contracting Act on January 1, 2011.

Charged with developing this program for all state agencies, public universities and technical colleges, GEFA is working with advisory groups from state government and private industry to develop model contract and procurement documents and accompanying program rules and regulations.

The benefits to Georgia will be substantial. The private sector estimates that energy savings performance contracting will help produce 11,000 direct and indirect jobs. These jobs will be created from work generated to help the state government reduce the impact of its current \$200 million plus electric and natural gas costs. Last, but not least, state government facilities will obtain new lighting fixtures, heating systems, insulation and other improvements that will provide long-lasting savings for current and future taxpayers. Over time, energy savings performance contracting has the potential to reduce state government's energy bills by up to 20 percent, exceeding the goal set in the Georgia Energy Challenge.

## CONSERVATION AND EFFICIENCY

Increasing conservation and efficiency is the simplest and most cost-effective way for Georgia to meet its future energy needs while preserving our environment and resources. The most recent regional energy-efficiency potential study, "Energy Efficiency in the South," was conducted by Georgia Tech and Duke University. It estimates that the Southeast region can avoid the construction of 49 gigawatts of new power plants through a set of efficiency and conservation measures during the next 20 years. Additionally, the study estimates the region could avoid costs of \$41 billion on energy bills by 2020 through a variety of strategic energy efficiency policies. GEFA does not endorse the referenced energy efficiency study and all of its policy recommendations, but the study does highlight the significant potential for energy efficiency in Georgia. The state of Georgia has already taken significant steps to improve conservation and efficiency, such as:

**Georgia Energy Challenge:** Broad public awareness campaign that includes state energy reduction goals, formal energy education curricula, residential and commercial energy modeling and demonstration projects. See the GEC sidebar on page 14 for more information.

**Clean Energy Property Tax Credit (CEPTC):** Includes incentives for buildings that achieve significant (30 percent) reductions beyond the required energy code or install efficient lighting systems or geothermal heat pumps. See the CEPTC sidebar on page 16 for more information.

**Energy Codes:** Georgia adopted the 2009 International Energy Conservation Code, making Georgia a leader in using energy codes to encourage efficiency and conservation as well as training home builders.

**The State Utilities Program:** Supports state facility managers and administrators in developing energy procurement and management strategies that control the state's energy costs, reduce the state's energy consumption, and improve the state's overall environmental performance. State facilities received \$65 million through ARRA and the SEP for energy-efficiency retrofits.

**The Work Away Initiative:** A management option that allows select employees to telework from home or other remote locations for one or more days per week. Under this program, more than 30,000 state employees now telework, saving almost five million commute miles each month. The program also includes compressed workweeks and other work schedule alternatives.

**Telecommuting Tax Credit:** Georgia created the nation's first telecommuting tax credit. Under the law, qualified Georgia employers may receive a tax credit for up to \$20,000 for planning, consulting, training and/or raw labor costs associated with



starting or expanding a telework program and an additional tax credit of \$1,200 per new teleworker. Eligible expenses include equipment (computers, telecommunications, data entry, and data processing), software and maintenance.

**Idle Reduction Strategy:** Georgia's Environmental Protection Division is working with stakeholders to reduce unnecessary diesel emissions associated with heavy-duty vehicle idling. Georgia is also supporting a pilot project to test the performance of idle reduction technologies for the trucking industry.

**Energy Savings Performance Contracting:** In November 2010, Georgia voters approved a constitutional amendment authorizing the use of energy savings performance contracting in the state of Georgia. See the sidebar on page 13 for more information.

**Weatherization Assistance Program:** Works with low-income households to reduce energy costs by providing free home energy efficiency testing and solutions.

**State Energy Program:** SEP received more than \$82 million in funding through ARRA to implement a variety of energy efficiency and renewable energy projects. Programs funded under SEP include renewable energy grants, energy efficiency grants, clean energy property rebates and state facilities retrofits.

**Building Operator Certification:** In 2010, GEFA provided \$45,000 to purchase a license required to provide Building Operator Certification (BOC) in Georgia. BOC is a nationally recognized, competency-based training and certification program that offers facilities personnel improved job skills to save money and energy in their facilities. Previously, no similar training courses were available in Georgia. In 2011, GEFA is providing \$13,750 in scholarships for 10 to 20 BOC students.

**Earth Craft House Program:** Through SEP formula grant funding, Georgia supports the Earth Craft House green building initiative. In 2010, 3,000 homes were certified.

**The Georgia Institute of Technology Industrial Technologies Program:** The Industrial Technologies Program partners with Save Energy Now LEADER companies who make a voluntary pledge to reduce their energy intensity and ALLY organizations who deliver resources to help companies achieve their energy reduction goals. LEADER companies are given priority access to energy assessments and other resources.

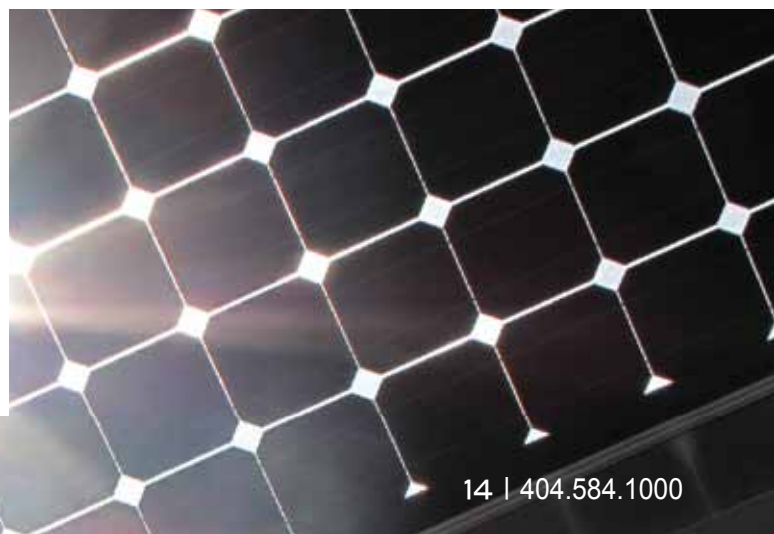
**The University of Georgia's (UGA) Cooperative Extension Service and Engineering Outreach:** Helps transform Georgia's agricultural population, industries, communities and agencies by improving their profitability, sustainability and competitiveness by providing technical assistance, education and practical solutions such as energy audits, biofuels feedstock analysis and carbon footprinting.

## GEORGIA ENERGY CHALLENGE

Former Gov. Perdue committed state agencies to reduce energy consumption 15 percent below 2007 levels by the year 2020. He also challenged citizens, businesses and local governments to do the same. Meeting this goal will reduce Georgia's dependence on traditional energy sources, support the local economy and improve the environment. Becoming better stewards of our energy use further ensures that Georgia's natural resources are protected for future generations to use and to enjoy. The GEC's objectives include:

**The State Energy Leadership Initiative:** Each year, state government uses more than 20 trillion Btus to run its facilities, spending in excess of \$200 million. Therefore, the 15 percent reduction in energy consumption could save the state more than \$30 million per year. GEFA has been working with state agencies to implement the State Energy Leadership Initiative portion of the GEC. Agencies established baseline energy usage and have been tracking the energy data. GEFA also worked with the agencies to develop energy management plans that detail a path to meeting the challenge. Good progress has been made by several agencies and campuses. For example, the Georgia Building Authority, which manages more than 70 facilities, including the Governor's Mansion and the Capitol, implemented an aggressive program that has reduced energy use per square foot by 27 percent from 2007 to 2010, spending \$1.4 million less in 2010 than in 2007. Darton College in Albany also reduced its energy use per square foot by 37 percent between 2007 and 2010, saving \$200,000 per year in energy costs.

**Energy Savings:** In February 2010, GEFA launched the new GEC website ([www.georgiaenergychallenge.org](http://www.georgiaenergychallenge.org)) featuring energy modeling tools that help Georgia residents, businesses, organizations and local governments meet the 15 percent energy reduction goal. The interactive site uses property-specific data to provide customized ways to save money and energy. It also provides links and resources to energy efficient and renewable energy tax incentives, rebates and low interest loans. Since launching the new site, more than 4,477 Georgians have voluntarily pledged a total of \$3,488,814 in energy saving measures that will reduce 13,955 MWh in energy consumption.





## RENEWABLE ENERGY AND RESEARCH

Georgia is known for its abundance of forest and agricultural resources. More than ever, these resources will be an important part of Georgia's energy picture going forward. Georgia boasts more than 24 million acres of forest land and ranks first in the nation for commercial timber land. In 2008, *Forbes Magazine* ranked Georgia the third best state in the nation for biomass energy potential. In addition to vast forest resources, Georgia has more than 10 million acres of agricultural land, much of which is well-suited for a variety of fuel crops, including more traditional crops such as corn and soybeans, but also land suitable for cutting edge fuel crops of the future such as miscanthus.

Landfill gas is a developing bioenergy resource in Georgia that has the potential to turn landfills across the state into green energy sources. Green energy programs available through utilities currently utilize landfill gas for electricity production. More recently, there are projects that utilize landfill gas for industrial operations and for transportation fuels.

Beyond forest and other bioenergy resources, Georgia is positioned to be a leader in advanced technology renewables such as solar and wind. The National Renewable Energy Laboratory (NREL) ranks Georgia 10<sup>th</sup> in the country for solar energy potential, due to most of the state having more than 5kWh/m<sup>2</sup> of solar radiation per day. This number puts Georgia in a similar solar potential category as parts of sunny states such as Florida, Texas and California. While Georgia has traditionally not been seen as a state with significant potential in wind energy, this is changing as organizations such as Georgia Power, Georgia Tech and various nonprofit organizations are performing studies on offshore wind potential in Georgia. Initial results are showing greater potential than previously thought.

Beyond the production of energy from renewable resources, Georgia is developing as a leader in the growth and attraction of clean technology industries to the state. Homegrown companies such as Suniva are performing cutting edge solar research and production, while outside companies such as Mage Solar and the ZF Group are choosing to locate operations here. See the sidebar on page 18 for more information.

### Steps Taken:

**Clean Energy Property Rebates:** Funds non-residential renewable energy installations. The rebates offset up to 35 percent of the cost.

**Energy Efficiency and Conservation Block Grants:** A limited amount of funds were used for solar installations, along with energy-efficiency projects.

**Clean Energy Property Tax Credits:** Funds renewable energy installations including solar PV panels, solar hot water, geothermal pumps and wind turbines. See the sidebar on page 16 for more information.





**E-85 Grant Program:** Georgia provided \$400,000 on a competitive basis to fund 27 E-85 fueling stations across the state.

**Studying and Promoting Wind Resources:** A number of groups in Georgia, including Georgia Tech, Southern Company, and nonprofit organizations such as the Southern Alliance for Clean Energy (SACE) and the Georgia Wind Working Group (GWWG), are working to determine the feasibility of wind power development in Georgia. New information regarding the improving feasibility of offshore wind in Georgia has been discovered over the past couple years as a result of these efforts. Southern Company is currently testing a meteorological tower off the coast of Georgia.

**Alternative Energy Education in Schools:** GEFA supported the installation of solar panels at Georgia Southern University to help provide students and instructors with a hands-on learning experience. In addition, through the GWWG and Blue Ridge Mountain EMC, GEFA supported the installation of the first wind turbine for a public school system in Georgia in Towns County during the fall of 2010. The wind turbine is part of a curriculum on renewable energy for local students as well as an opportunity for the broader community to learn about wind energy.

## BIOENERGY

Georgia has long been recognized as a leader in bioenergy development and innovation potential due to its abundant forests and agricultural resources. Significant bioenergy resources in Georgia include biodiesel and ethanol from crops, wood to electricity biomass, including pellets, and promising new non-food energy crops such as miscanthus. While the resources for significant bioenergy production are without question, the economics of developing these resources have been challenging since the recession started in 2008. However, the end of 2010 brought good news for a variety of bioenergy projects in Georgia. After being allowed to lapse, the federal biodiesel tax credit has been extended through 2011, which makes Georgia's biodiesel price competitive with petroleum diesel. Additionally, the U.S. Department of Agriculture's Biomass Crop Assistance Program (BCAP) has been redeveloped with new definitions and procedures and is now operational. BCAP encourages the planting of energy crops and helps subsidize the transportation costs of biomass feedstock. Other promising areas of bioenergy in Georgia currently include wood pellet production for electric generation in the European Union and the growth of miscanthus for biomass energy. Wood pellet production in Georgia also has the potential to support the forest product supply chain that has been hit hard since the downturn in the housing market.

A current trend in the bioenergy industry is the push to commercialize technologies that convert biomass into liquid transportation fuels that are virtually indistinguishable from petroleum-based fuels. These "high-energy drop-in fuels" could be directly blended with conventional gasoline, diesel or jet fuel and stored or transported using existing infrastructure.

Currently, electricity generation from biomass is facing delays due to potential regulations on greenhouse gas emissions from the federal government. Georgia has significant potential for electricity generation from biomass, but to date it is not a significant part of the electricity generation mix.

## CLEAN ENERGY PROPERTY TAX CREDIT

As part of GEC, Georgia offers tax credits for certain types of energy efficient and renewable energy property, as well as for the delivery of wood residuals to qualified biomass facilities. The CEPTC legislation was signed by former Gov. Perdue in 2008.

The credits are available to taxpayers placing qualified clean energy property in service between July 1, 2008, and December 31, 2012. The program has an annual cap of \$2.5 million. A change to the CEPTC was enacted during the 2010 session of the Georgia General Assembly. Beginning with taxable year 2010, if a taxpayer is denied the tax credit because the \$2.5 million cap has been reached, then the taxpayer can reapply the following year. The CEPTC program has been very popular. In 2010, GEFA received 450 applications totaling more than \$25 million in requested funds, despite the program having a \$2.5 million limit. Due to legislation passed in 2011, starting in 2012 the CEPTC will increase its annual cap to \$5 million and will last through 2014.

The tax credit generated significant energy metrics in its first three years. Through the installation of the clean energy technologies, 374 jobs were created. The tax credit generated \$2,368,885 in sales tax revenue from a total investment of \$37,661,968. Additionally, \$9,010,793 in annual energy costs, 40,306,325 kWh of electricity and 40,306,325 Btus have been avoided. Technologies that qualify for the tax credit include solar hot water, solar PV, active solar space heating, wind, geothermal, biomass gasification and pyrolysis, lighting retrofits, and other energy efficient building retrofits. The maximum credit limit available per credit is 35 percent of total project cost.





## ADVANCED TRADITIONAL TECHNOLOGY

Despite setbacks due to the recession, Georgia is poised for population and economic growth. Georgia's growth is going to require an increased supply of energy, and while a significant portion of energy demand growth can be met through efficiency, conservation and renewables, there will also be more need for energy from traditional sources, including coal, natural gas and nuclear. As pressure grows to reduce carbon and other emissions, opportunities for advanced traditional technologies will increase.

Due to abundant supply and low-fuel costs, coal and natural gas will remain a significant contributor to Georgia's energy supply for decades. There are, however, opportunities for coal and natural gas electricity generation to improve efficiency and reduce emissions. Promising coal technologies currently being researched, developed and implemented across the U.S. include ultra super-critical technology steam turbines, which can reach efficiencies of up to nearly 50 percent, integrated combined cycle gasification, and carbon capture and storage facilities that have the potential to greatly reduce carbon emissions from coal-fired power plants. Modern combined cycle natural gas turbines already operate at high-efficiency levels and have significantly less emissions than coal-fired turbines. Operational flexibility, low emissions and decreasing fuel costs have led to a significant increase in electricity generation from natural gas in Georgia, as well as the rest of the U.S.

In addition to fossil fuels such as coal and natural gas, nuclear is likely to play an increasingly important role in Georgia's energy future. Nuclear provides steady baseload power generation without the emissions concerns of coal and natural gas. In a potentially carbon constrained future, nuclear has many advocates and Georgia is a leader in supporting new nuclear development.

### Steps Taken:

**Plant Vogtle Nuclear Expansion:** Plant Vogtle is currently in the process of adding two new reactors, which are set to open in 2016 and 2017. See page 18 for more information.

**Smart Grid Technology:** Georgia Power and the Georgia EMC's are rolling out their "smart meter" technologies, which are key components of smart grid technologies. The use of smart meters by electric utility customers will allow for more interactive awareness and analysis of energy consumption rates, leading to better opportunities for load shifting, reliability, conservation and efficiency. In addition, private companies, including GE Energy, are growing research and development operations along with jobs in Georgia.

**Smart Grid Education:** The PSC received a four-year grant from the DOE to fund initiatives to educate staff and members of the PSC on emerging smart-grid technology and policy implications.

## NUCLEAR POWER

Nuclear power has been a part of Georgia's energy profile for many years and is set to continue as an important source of electric generation in the future. Recent years have seen a decline in the percent of Georgia's electric capacity that was met through nuclear, from 15.7 percent in 1998 to 11.1 percent in 2008. This is due to an increase of other electric sources such as natural gas. However, nuclear has seen a recent push for expansion due to its low-operating cost, abundant fuel and zero-carbon emissions.

In Georgia, Plant Vogtle, jointly owned by Georgia Power, Oglethorpe Power, MEAG Power and Dalton Utilities, is adding two new 1,100 MW Westinghouse AP 1000 reactors. Plant Vogtle Units 3 and 4 are set to open in 2016 and 2017, respectively, which will likely make them the first nuclear reactors completed in the U.S. since the 1980s. In 2009, Senate Bill 31 was passed by the Georgia General Assembly to allow for rate payer funded financing of the Plant Vogtle expansion. Construction has begun on the site.



## WHY GEORGIA FOR CLEAN TECHNOLOGY INDUSTRIES?

Georgia has become a magnet for clean technology industries, including smart grid technologies and manufacturing components for wind and solar infrastructure. Many clean technology companies with strengths in technology for energy efficiency, energy conservation and advanced manufacturing technologies flourish here, including GE Energy, Johnson Controls, Georgia Power, Suniva and Siemens. Georgia has an abundance of resources that contribute to the success of these companies and encourage others in the industry to consider Georgia.

Georgia has highly-trained and educated workers. The University System of Georgia has engineering schools with varying emphasis at the University of Georgia, Southern Polytechnic State University, Georgia Southern University, and nationally-ranked Georgia Tech. In addition to the state's universities, Georgia operates strong training programs. Quick Start ([www.georgiaquickstart.org](http://www.georgiaquickstart.org)) is a highly-regarded state-run training program affiliated with the state technical colleges. Training is tailored to the needs of individual companies operating in the state. The Georgia Work Ready program ([www.gaworkready.org](http://www.gaworkready.org)), which is run by the Governor's Office of Workforce Development, certifies displaced workers by skill-set to expedite hiring.

Georgia boasts world class infrastructure, making it easy for goods, services and people to access other points across the globe. Georgia has the Hartsfield-Jackson Atlanta International Airport, the world's busiest; a rail network of more than 5,000 miles; and the ports of Savannah and Brunswick.

Other reasons for clean technology success in Georgia include the GDEcD, which maintains an inventory of available industrial sites and helps prospective companies connect with local development authorities. Additionally, Georgia has affordable and reliable industrial electric power, provided by Georgia Power, Oglethorpe Power, MEAG Power and 42 electric membership corporations, which help Georgia industries remain competitive in the marketplace.





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