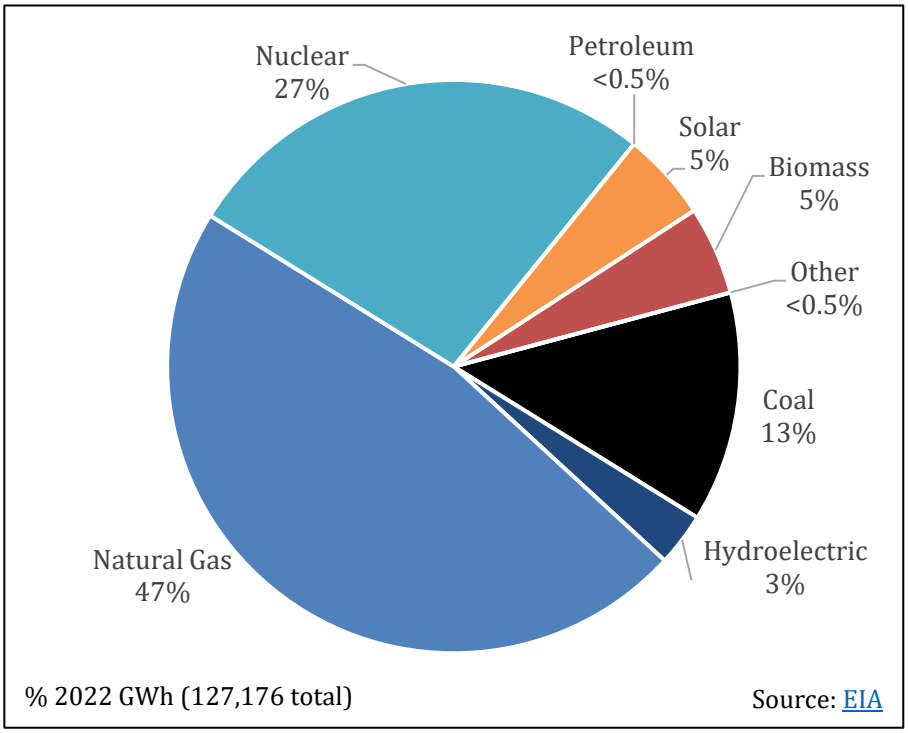
State Brief: Georgia

BACKGROUND

Although natural gas is the largest contributor to Georgia's electric generation mix, Georgia has no appreciable in-state fossil fuel resources. While transportation is the leading energy consuming end-use sector, there are also many energy-intensive industries in the state.

The Peach State ranks first in the nation for use of wood and wood-derived fuels for electricity generation. Georgia has experienced rapid growth in the solar sector, largely driven by utilities and utility-scale projects. In 2012, Georgia had negligible solar generation capacity. By the end of the first quarter of 2023, the Solar Energy Industries Association (SEIA) ranked the state 7th in the country in terms of installed capacity (5,041 megawatts (MW)) and 16th for projected growth over the next five years.

Georgia's Estimated Net Annual Electric Generation, 2022



% 2022 GWh (127,176 total) Source: EIA

While Georgia does not have a clean energy standard or a voluntary clean energy goal, utilities in the state are increasingly adopting clean energy technologies. For instance, Georgia Power's recently approved 2022 integrated resource plan (IRP) will add an additional 2,300 MW of renewable energy resources to the utility's portfolio by 2025 and proposes increasing the utility's renewable electric generating capacity to 6,000 MW by 2035; retiring all but two "Georgia Power-controlled" coal generation units in the state by 2028; and deploying an additional 500 MW of energy storage. The utility's proposal for a new distributed energy resource (DER) customer program was approved as a 250 MW pilot program and an income-qualified community solar pilot program was also approved. After years of delays, Plant Vogtle's third reactor reached 100% energy output in May of 2023, with reactor four expected to enter service in early 2024. The 2,200 MW project marks the nation's first nuclear expansion project in 30 years.

The 2023 U.S. Energy and Employment Report found that in 2022, Georgia had an estimated 203,319 energy workers (4.3% of total state employment), which includes 55,605 workers employed in energy efficiency. In a 2022 report, Georgia ranked 16th nationally for clean energy jobs, with approximately 75,211 Georgians employed by the industry.

The Georgia Public Service Commission (PSC) regulates the state's major investor-owned utility (IOU), Georgia Power, and has limited regulatory authority over 42 electric membership corporations (EMCs) and 52 municipally-owned electric power companies in the state. The PSC is composed of five elected members who serve six-year terms. Currently, all five commissioners are Republicans. The state is under unified control with the Republican Party holding majorities in both chambers of the General Assembly and Republican Governor Brian Kemp leading the executive branch.

POLICY STRENGTHS AND OPPORTUNITIES

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[1] an important framework for policymakers to consider. The basic idea behind policy stacking is that there is an interdependency and sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, market preparation policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, market creation policies, create a market and/or signal state support for clean energy technologies. Tier 3, market expansion policies, create incentives and other programs to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

For example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, states should adopt policies to address interconnection and stand-by rates before adopting financial incentive programs.

INVESTING IN THE WORKFORCE

In 2022, there were nearly 3.1 million net-zero aligned jobs in the U.S., comprising over 40% of total energy jobs. However, a lack of qualified candidates across occupations and education levels could impede states' abilities to modernize their grids and deploy clean energy resources. To ensure that the workforce can meet industry demand, policymakers can consider several policies to educate and train qualified candidates. This can simultaneously enhance industry employment and provide economic opportunity to individuals and local communities.

The policies states can explore to address workforce development include:

1. **Incentive Programs** – States can attract new workers to the field by providing financial and other incentives to students who pursue education in specified trades or in the science, technology, engineering, and math (STEM) fields. States might require that graduating students remain and work in the state for a given time to remain eligible for the incentive. In conjunction with this, states might also provide economic development incentives to companies employing students with training in specified STEM and trades fields. To ensure safety in the workplace, states can adopt programs that will cover the costs of OSHA training.

   Initiatives to improve access to broadband and public transportation in underserved communities can boost access to educational and employment opportunities.

2. **Education and Continuing Education** – Existing electrician training and mentorship programs can be expanded to encourage more young people to enter the industry. Policymakers can direct public colleges and universities, with input from industry, offices of economic and workforce development, and other interested parties, to create new trades and STEM programs. This could include the development of "green" credentialing programs. States can also provide financial resources to organizations that educate or retrain students in STEM and trades professions.

   For the state's existing energy workforce, policymakers might direct state departments of workforce services or their equivalent to work with utilities and other interested parties to develop continuing education and training programs for existing utility employees to remain in their field or to transition to a new role. Incentive programs might also be developed for employers that design roles that include ongoing skills development and continuous learning to help keep pace with evolving roles.

[1] V.A. Krasko and E. Doris. 2012. "Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions." *National Renewable Energy Laboratory*. Available: http://www.nrel.gov/docs/fy13osti/56428.pdf.

3. **Establishing an Office of Workforce Development** – States might also consider establishing a dedicated workforce development office. In some states, these have been established to specifically address training needs in energy transition communities.

The Interstate Renewable Energy Council (IREC) developed a set of Career Maps to demonstrate the various types of careers offered in the clean energy industry. The Green Buildings Career Map, the Solar Career Map, and the HVAC/R Map are helpful tools for anyone from job seekers and employers to policymakers looking to explore the employment opportunities presented by the industry. IREC also created a Registered Apprentices Toolkit for Clean Energy Employers, which provides information about and resources for implementing Registered Apprenticeship Programs (RAPs) to spur the development of a clean energy workforce.

MODERNIZING UTILITIES AND EMPOWERING CONSUMERS

The electric grid is a complex system of generation, transmission, and distribution. Aging infrastructure and emerging technologies are forcing the grid to modernize to keep pace with historic and emerging expectations. Grid modernization encompasses a broad range of actions intended to make the electric system more resilient, interactive, and capable of meeting current and future demand.

The transition to a digital economy requires affordable, sustainable, and reliable electricity and creates challenges and opportunities for grid management. Emerging physical and cybersecurity threats and increased demand for faster outage response times require, at minimum, real-time incident tracking and response capabilities. Increased grid penetration of distributed energy resources (DERs) such as renewable energy coupled with increasing adoption of energy efficiency, energy storage, microgrids, and other technologies will provide economic benefits, increase security, and ensure more reliable, resilient, and clean energy. Utility-scale renewable energy may require expanded transmission capabilities. As adoption of these innovations increases, so too will the need for modern grid technology to strengthen the grid, the implementation of which will require substantial planning and investment by states and utilities.

By allowing a two-way flow of information between the electric grid and grid operators and between utilities and their customers, new technologies enable utilities to better manage the grid and provide opportunities for consumers to customize their services to fit their priorities and to reduce their electric bills. By enabling better tracking and management of resources, emerging technologies improve system reliability and resiliency. These technologies also allow grid operators to incorporate central and distributed energy resources, energy storage technologies, and electric vehicles (EVs). This all assists in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency.

On the customer's side of the meter, dynamic pricing, advanced metering infrastructure (AMI), and other technologies allow a more dynamic exchange of information and electricity between a consumer and their electric provider. Grid modernization is associated with greater consumer choice by allowing customers to meet their energy priorities by producing and storing their own energy or through contracting for innovative clean energy services from different providers.

Grid modernization will require a suite of policy changes to support advancements in grid technologies, grid management, and utility regulation.

While Georgia does not have a state-wide grid modernization plan, Georgia Power's Grid Investment Plan includes $1.3 billion in investments to improve grid resiliency and reliability. The plan focuses on upgrading transmission and distribution infrastructure to increase resiliency and affordability across the power sector. In 2020, Georgia Power, in partnership with the Georgia Institute of Technology, launched a 1.5 MW microgrid in Atlanta's Tech Square CODA, in part to serve as R&D for the potential for microgrids to be self-sustaining while also supporting grid resilience.

In February 2021, several utilities operating in Alabama, Georgia, Kentucky, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, and Tennessee filed plans with the Federal Energy Regulatory Commission (FERC) to establish the Southeast Energy Exchange Market (SEEM) aimed at improving their ability to trade power across the region. SEEM began operations in November 2022 and now includes a total of 23 entities across 12 states (adding service territories in Florida, Iowa, and Virginia). Proponents of renewable energy and FERC raised concerns about

the market's lack of transparency, and some have argued that it will not incentivize the development of clean energy resources or reduce costs to ratepayers. On the other hand, some argue that SEEM is an important first step in increasing renewable energy integration in the southeast. In June 2021, the utilities amended the proposal to create greater transparency and provide for additional oversight by FERC. However, this has not ameliorated concerns that SEEM favors powerful utilities and does not capture the full range of benefits of a true wholesale market. In July 2023, a federal appeals court directed FERC to reconsider several aspects of its 2021 approval of SEEM.

The Infrastructure Investment and Jobs Act of 2021 (IIJA) is a landmark federal spending bill that includes funding earmarked for grid modernization projects. This includes $11 billion for Department of Energy (DOE) grants directed specifically towards electric infrastructure resiliency projects (including grid hardening against severe weather and cybersecurity improvements), $2.5 billion for transmission development, and $3 billion for the Smart Grid Investment Matching Grant Program.[2] Enacted August 2022, the Inflation Reduction Act (IRA) set aside $2 billion for loans for constructing new high-capacity transmission lines and upgrading interties. The bill includes funding for technical assistance and grants for states and tribal governments, which includes assistance for siting transmission projects. The bill also directs DOE to undertake interregional transmission planning, modeling, and analysis, including analysis of transmission for offshore wind and the use of grid-enhancing technologies (GETs).[3]

There are policies that Georgia's policymakers could adopt to support in-state grid modernization efforts:

1. Develop a grid modernization strategy through a collaborative process. Alternatively, states might decide to require that utilities develop and propose a ten-year grid modernization plan to the public utilities commission within a specified timeframe. Utilities would then be required to implement that plan within another specified timeframe. Strategies and/or plans should outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals.

2. States might also provide incentives or cost recovery mechanisms for utilities that meet grid modernization goals. Policymakers could consider directing the PSC to evaluate alternative ratemaking mechanisms, performance-based regulation, and/or new utility business models that support grid modernization.

3. State policy should include measures to protect data regarding customer behavior but can also encourage the use of this information to facilitate additional improvements in grid management and customer service. To address this, policymakers can develop legislation or direct commissions to promulgate rules that clarify that the customer owns the energy data associated with their energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data possible. States could establish customer access to energy data through the Green Button Connect program, for example. While there is no statewide policy requiring smart meters, Georgia Power has taken the lead on residential smart meter deployment and has converted all of its meters to advanced meters.

The adoption of incentives for or a requirement to integrate a certain amount of renewable energy and energy storage on the grid alongside enhanced building energy standards and electric vehicle policies can support grid modernization efforts.

MAINSTREAMING RENEWABLES

Renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). With increased deployment, utilities are learning more about how to integrate renewables effectively, investors are becoming more comfortable with the technologies, and building code officials are recognizing common standards and best practices for integrating distributed renewable energy resources. In the U.S., the expansion of renewable energy has been one of the most consequential shifts in electricity generation over the last decade. According to the EIA, renewable energy generation surpassed coal and nuclear generation in 2022, and more than half of all new generation capacity in 2023 is expected to be solar. As of 2022, there were more than 470,000 jobs in

[2] For more information on the grid-related earmarks included in the IIJA, see Potomac Law Group's January 2022 analysis: "The Infrastructure, Investment & Jobs Act of 2021: What's in It for You? (Part V: Grid Infrastructure and Resiliency)." Available: https://www.potomaclaw.com/news-Infrastructure-Investment-Jobs-Act-of-2021-Whats-In-It-For-You-Part-V-Grid-Infrastructure-and-Resiliency.

[3] J. Runyon and J. Engel. 2022. "The Inflation Reduction Act is Signed into Law." *PowerGrid International*. 16 August. Available: https://www.power-grid.com/td/the-inflation-reduction-act-is-signed-into-law/#gref.

the wind and solar industry. Accordingly, it is in the interest of policymakers to ensure that their states are well positioned to benefit from this shift.

While the IIJA doesn't provide money for specific renewable energy projects, the funding in the Act will benefit renewable energy development as grid resiliency, increased deployment of energy storage, and modernized transmission are all essential to the successful integration of renewable energy generation. The IRA appropriated $369 billion to fund a variety of energy and climate initiatives – the largest climate investment in U.S. history. The bill also extended the investment tax credit (ITC) and the production tax credit (PTC) through the end of 2024 and revived the PTC for solar projects. For projects placed in service in 2025, the bill "effectively extended" the ITC and PTC by creating new tax credits for zero emission facilities. The bill also extended the residential energy property tax credit through 2034 and created a new advanced manufacturing production credit, to apply to sales of components for constructing wind and solar energy facilities beginning in 2023.[4]

The IRA also includes several provisions related to energy equity, including $3 billion to the Environmental Protection Agency (EPA) for grants for community-led projects in disadvantaged communities and $27 billion for nonprofit, state, and local climate finance institutions supporting the deployment of low- and zero-emission technologies. In support of rural communities, the bill also includes a $1 billion appropriation to the U.S. Department of Agriculture (USDA) for loans to finance renewable energy projects, $1 billion for USDA's Rural Energy for America Programs, and $9.7 billion to USDA to finance rural electric cooperatives' purchases of renewable energy.

To reduce barriers to customer and utility participation in the renewable energy market, and to build upon the federal initiatives, policymakers in Georgia might consider several options.

Customer-Oriented Policies

1. **Interconnection, Net Energy Metering (NEM), and Streamlined Permitting** – In general, customers want a clear, streamlined, affordable, and predictable system for connecting renewable energy systems to the grid. To ensure this, Georgia's policymakers could consider adopting IREC's model interconnection procedures, removing NEM system size limitations and the aggregate capacity limit, and crediting net excess generation at the customer's retail rate. Georgia's distributed generation compensation rules do not require that utilities offer net metering. Currently, Georgia Power credits distributed generation customers at the avoided cost rate (the marginal cost for a producer to generate one more unit of power) not the full retail rate. In 2019, the PSC required that Georgia Power offer net metering for up to 32 MW or 5,000 rooftop solar customers, whichever came first. The program cap was met in 2021.

   Allowing aggregated net metering would be beneficial to agricultural operations, commercial properties, and public entities like state and local governments, universities, and schools. The state might also consider establishing either statewide standards for streamlined permitting processes, or resources to support local governments that voluntarily implement a streamlined program. In May 2021, NREL launched the SolarAPP+, an online platform designed to automate the solar permitting process. By running compliance checks and processing permit approvals, the service is intended to drastically reduce permit wait times. Currently restricted to rooftop solar, thirty-two communities in five states have adopted the platform, processing over 15,000 permits for more than 100 MW of generation with an estimated 15,000 hours saved in permit review time.

2. **Shared Renewables** – Due to building and property attributes and ownership issues, many customers are unable to install renewable energy technologies where they live or work. Allowing shared, or community, renewable energy projects addresses these barriers. These projects have multiple owners or subscribers who pay for a portion of the project or the generation provided by the system. Georgia Power currently offers 8 MW of shared solar through their Community Solar Program.

   Low credit ratings often deter participation in renewable energy markets; this can affect low- and moderate-income (LMI) households' adoption of renewable energy solutions. Supportive policies for shared renewables can be designed to encourage participation by LMI households; this can increase adoption of renewable

[4] For a detailed discussion of the IRA's tax provisions, see: A.S. Levin-Nussbaum. 2022. "Update: President Biden Signs Historic Legislation Providing Expansive Clean Energy Tax Incentives." *The National Law Review*. 17 August. Available: https://www.natlawreview.com/article/update-president-biden-signs-historic-legislation-providing-expansive-clean-energy.

technologies and reduce energy costs. Low-income participation can be ensured either through a percentage mandate for the overall annual contracted capacity, or by offering a higher rate of payment for the portion of shared solar capacity attributed to LMI customers. States that have a shared renewables program may want to coordinate this program with implementation of the federal Weatherization Assistance Program (WAP) to provide recipients of assistance with access to participation in a shared system.

3. **Adapt Energy Assistance Programs** – Programs such as the Low-Income Home Energy Assistance Program (LIHEAP) and WAP provide assistance for paying utility bills and reducing household energy costs. Including distributed energy resources as eligible for funding under these programs can reduce energy costs and increase energy security for those LMI families who are able to benefit from WAP and LIHEAP. Colorado, for example, includes rooftop solar in their WAP program. For approval to add solar to a state's implementation of WAP, a state must show that the investment would be cost-effective – achieving a Savings to Investment Ratio (SIR) of 1.0 or more.[5] Since 2015, Georgia has received $29.2 million from WAP and $8.9 million from the State Energy Program (SEP) which has helped to fund a number of energy initiatives in the state.

4. **Fund Distributed Generation (DG) for Community Organizations** – Organizations or groups that provide support services for LMI communities can be provided funding to install solar or other distributed energy resources. Sites such as homeless shelters, food banks, clinics, and community centers often have enough rooftop area for solar installations. After installation, these resources can reduce an organization's utility bills, freeing up funds for other activities that support the community.

5. **On-Bill Financing/Pay As You Save (PAYS)** – On-bill Financing and Repayment programs enable consumers to invest in energy upgrades with no upfront payment. The utility or a third party will pay the initial costs to install the upgrade with the cost of that upgrade recovered through the utility bill. Because repayment includes consideration of the cost savings resulting from the energy upgrade, customers can see monetary benefits almost immediately. Once equipment costs are recovered, the equipment belongs to the customer. State policies that reduce lending risk by creating a loan loss reserve and/or a credit enhancement fund can encourage lending to customers that might otherwise not qualify for a loan and can keep interest rates low.

6. **Corporate Procurement** – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. Since 2014, over 70 gigawatts (GW) of renewable energy has been procured by corporate entities. In the first half of 2022, corporations entered contracts for 21 GW. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. Several recent actions in the state are contributing to a favorable environment for corporate renewable energy procurement in Georgia. House Bill 57, enacted in 2015, authorized third party financing to facilitate investment in solar energy around the state. Georgia Power offers an opportunity for all customers to purchase renewable energy credits or solar energy through their Simple Solar Program. Georgia Power also offers a Customer Renewable Supply Procurement Program for commercial and industrial customers. Policymakers might consider incorporating corporate renewable procurement targets into the state's IRP process. By integrating these renewable purchase commitments into the IRP process, utilities can avoid over-building resources and stranding generation assets.

Utility-Oriented Policies

Some states have created programs that aim to reduce greenhouse gas (GHG) emissions and increase investments in clean energy resources. Utilities are also setting their own GHG reduction goals and are increasingly investing in clean energy resources. As detailed above, Georgia Power's 2022 IRP proposed increasing the utility's renewable energy capacity, retiring all but two coal generation units by 2028, and deploying 500 MW of energy storage by 2030. The Tennessee Valley Authority (TVA) has a net-zero by 2050 goal, with plans to add up to 10 GW of solar on its system by 2035. Duke Energy plans to fully exit coal generation by 2035. Georgia's voters also support reducing emissions and increasing investments in renewable energy. A 2021 survey of state residents found that 70% support new solar and 64% support new wind.

To increase utility adoption of clean energy technologies, Georgia's policymakers might consider the following:

[5] For guidance on the state approval process, see WAP Memorandum 024 (2017), the Solar Template for Incorporating Solar Photovoltaics into WAP, and the Preliminary Assessment Guide for Integrating Renewable Energy into Weatherization (2019).

1. **Emissions Standards** – Emissions targets can take a technology neutral approach that looks at the total emissions of the utility portfolio and drives emissions down with a combination of renewables, traditional fuels, efficiency, and technological advances. Emissions reductions can be achieved through (1) a carbon portfolio standard approach, or (2) a market-based approach. A portfolio emissions standard sets emissions reduction targets to be achieved over time. This can be implemented through the IRP process or by establishing a maximum allowable rate of emissions per unit. Under a market-based approach, a state or a group of states might set a certain emissions reduction target, for example, 50% below 2005 levels by 2030. This reduction is achieved by the distribution of annual emission allowances that decrease to the point that the standard is met in 2030. One of the advantages of a market-based program is that it is designed to reduce emissions in the most economically efficient manner possible. Such a standard can also address other concerns such as pollution, asthma risk, environmental justice, and water use.

2. **Transmission Development Policies** – Renewable energy resources rely heavily on robust transmission networks that connect generation to demand. For states within regional transmission organizations (RTOs), state governments can fund utility commission and energy office engagement in RTO processes, and generally support transmission build-out through these channels. In non-RTO states or single-state RTOs like New York and California, one successful model has been the creation of a state transmission authority, which handles state transmission planning in cooperation with incumbent utilities. New Mexico's Renewable Energy Transmission Authority provides an instructive example – it informs transmission investments to push forward key transmission projects that achieve the state's clean energy goals cost-effectively.

3. **Competitive Procurement Requirements** – In most states, consumers have little choice about where their electricity comes from. As utilities find that renewable energy is increasingly the lowest-cost electricity source, they have to decide how much they should buy and when. Unfortunately for customers, utilities may have either a vested interest in continuing to operate fossil plants, or they doubt the efficacy of new renewable resources. States can overcome reluctance to renewable energy by requiring utility procurement decisions to undergo a competitive process, revealing the lowest cost alternatives to the utility's existing contracts and fleet of power plants. A best practice is "all-source procurement," a process that allows all resources to compete to fill a system need identified by the utility.

   States can start by requiring PUCs to begin a participatory planning process that links planning outcomes to procurement decisions and ensures that state policy objectives are included in system planning. For some states, this might mean setting up a planning process. For others, it might involve revisiting planning and procurement rules and asking whether the current process results in policy-aligned procurement. States might amend existing rules to require utility commission approval of utility plans or require consideration of public comments. Regulators may need explicit direction to consider objectives beyond reliability, affordability, and safety.

   In its 2022 order approving Georgia Power's 2022 IRP, the PSC established an all-source procurement requirement for all future capacity additions by Georgia Power.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while also maximizing the value of grid resources. By deploying storage to strategic locations, utilities can more effectively manage their energy portfolios. First, storage allows utilities to manage intermittent demand – helping reduce peak demand requirements. Because the generation resources that provide peak power are the system's most expensive, reducing peak demand can save consumers money. Second, the responsiveness of energy storage can allow utilities to implement voltage regulation and other ancillary services, which improve system efficiency. Third, because storage technologies can both store and dispatch power, storage enables better integration of intermittent power generation resources, like wind and solar, to the grid.

The flexibility of battery storage combined with advanced metering infrastructure can allow customers to control how and when they use energy from the grid or from solar panels installed on their home or business. In most cases, this can provide greater cost savings than standalone solar systems. Combined with time-varying rates or real-time pricing programs, state policy can further support customer choice and open a new market for energy services.

Prices that better reflect the time-varying and location-dependent costs of producing and delivering electricity can also lead to a number of economic and environmental gains.

Energy storage can also help the commercial sector avoid demand charges, which establish an incremental cost above energy usage based on the highest period (highest 15 minutes, for example) of demand during the month. Eliminating spikes in demand with storage can reduce these costly charges for businesses. As utilities around the country consider implementing or extending demand charges to other sectors, energy storage will become more relevant as both a customer cost-saving investment and a system efficiency measure.

Declining costs and technological advancements in battery storage have contributed to increased deployment. The EIA expects total battery storage deployment to more than triple from 7.8 GW in 2022 to 30 GW in 2025. State policies can further encourage this by establishing both a framework for easy integration of energy storage resources onto the grid and a marketplace that monetizes the benefits of energy storage for cost-effective investment.

Georgia Power received approval through their 2022 IRP to own and operate 765 MW of energy storage by 2030, which includes the 265 MW McGrau Ford Battery Facility. The utility is also partnering with Form Energy to deploy a 15 MW multi-day battery storage project that uses "a novel" iron-air-exchange technology.

The IIJA provides a unique opportunity for funding energy storage projects. The IIJA provides $505 million for grants to support energy storage demonstration projects, more than $7 billion for building out the U.S. battery supply chain, and $14 billion for grid resilience programs that include energy storage as a qualified technology. The IRA extended the ITC to include standalone energy storage systems. When the ITC is replaced by the technology neutral Clean Electricity Investment Tax Credit (CEITC) in 2025, qualified storage facilities placed in service after 2024 will remain eligible. The advanced manufacturing production credit will apply to battery cells and modules and the critical minerals used in their production. The $27 billion GHG Reduction Fund, also established by the bill, will provide funding enabling low-income or disadvantaged communities to adopt zero-emission technologies including energy storage.

There are several policy opportunities to take advantage of the growing technological advances in and declining costs of energy storage and build upon recent federal initiatives. The recommendations here draw heavily from IREC's 2017 report, "Charging Ahead – An Energy Storage Guide for Policymakers." Policymakers in Georgia could consider the following:

1. Amend existing interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. IREC has produced a series of interconnection protocols that states can easily adopt. The state could establish best practices for interconnecting storage in statute, or legislation could provide an instruction to the PSC to update existing policy.

2. Instruct the utilities commission to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it is cost-effective or identify the price point at which it will be cost-effective. Ensure that cost-effectiveness calculations include all the benefits storage can deliver to the system, including frequency regulation and avoided investments in new infrastructure.

3. Require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required that utilities evaluate the cost effectiveness of non-wires alternatives to large transmission and generation investments. Alternatively, states might want to require that utilities develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the greatest value.

4. Consider creating a mandatory energy storage procurement target or requirement for energy storage with a documented process for periodic review of progress towards that goal. Procurement targets can limit the amount of utility-owned storage; require that a certain amount of storage be targeted to low-income customers; and create carve-outs for storage at the transmission, distribution, and customer levels. Procurement targets can jump-start market creation, spur fast learning, and guide the development of a regulatory framework.

5. Finance and incentivize energy storage for customers and utilities. Incentives can enable customers to use storage to manage their electric load and store locally produced renewable energy. Incentives in the form of rebates, grants, and tax credits can provide a bridge to scalable deployment of storage. Incentives can be

designed to decline as storage values become more readily monetized and/or as the cost of storage decreases. Policymakers could allow utilities that provide incentives to customers to recover the costs of installing smart meters. This would enable dynamic and time-varying energy management from multiple distributed battery systems. This could also signal to customers the value of leveraging storage and better align customer costs with system costs. Financing energy storage installations for commercial customers could help reduce their demand charges. Policymakers might want to start first with a policy that provides grants to pilot projects. Incentive programs might also target solar system owners. Financial incentives should be designed to ensure that the state will meet other goals including emissions and peak demand reductions, and equitable access to clean energy.

6. Clear data access policies that allow third parties to provide energy management services based on signals from the utility can greatly increase the value of efforts to monetize the value stream offered by energy storage. State policy should include measures to protect customer data, while also encouraging the use of this information to facilitate additional improvements to grid management and customer services. To address this, policymakers can develop legislation or rules that clarify who owns the energy data associated with customer energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data possible.

7. Consider taking advantage of the "direct pay" option available to state and local governments for energy storage investment tax credits (ITC) available in the IRA. The direct pay option allows states (or other qualified entities without tax obligations) to be directly refunded a 30% ITC from the federal government after the project is online. The IRA also allows for up to a 70% credit for projects that incorporate domestic components, serve low-moderate income communities, and/or are located in energy communities.

THE BUILT ENVIRONMENT

In the U.S., buildings consume nearly 40% of total energy used.[6] Because it reduces energy demand and emissions and creates savings for utility customers, energy efficiency[7] often plays a prominent role in state energy and climate policies. Coupled with beneficial electrification, which involves replacing direct fossil fuel use with electricity, there is even greater potential to reduce energy costs and pollution, and provide more resilient, comfortable, and healthy buildings. This is especially the case in states where increasing levels of low carbon resources are supplying the electric grid. When policies are adopted to shift energy sources for such things as space and water heating, to highly efficient electric alternatives, states can maximize achieving the dual objectives of increased energy efficiency and reduced emissions. In some cases, this can also result in lower energy costs.

The state has taken some steps to incorporate energy efficiency and beneficial electrification into its built environment. Public entities are authorized to enter into Energy Savings Performance Contracts. Though revenue decoupling and performance incentives are currently not authorized in Georgia, some cost recovery of utilities' efficiency improvements is allowed. The American Council for an Energy Efficient Economy (ACEEE) publishes a State Energy Efficiency Scorecard that evaluates states' energy efficiency programs and policies in six policy areas, focusing on equity and policies that assist low-income and disadvantaged households. Georgia ranked 39th. In addition to its Energy Efficiency Scorecard, ACEEE tracks how states are incorporating equity into their energy efficiency and clean energy programs and policies.

The IIJA provides $500 million for grants to fund energy efficiency and renewable energy upgrades in public schools, $3.5 billion for the Weatherization Assistance Program, and increases funding for the Energy Efficiency and Conservation Block Grant program by $550 million and the State Energy Program by $500 million. The IRA appropriates $4.3 billion to DOE for an energy efficiency rebate program that will be administered through state energy offices. Another $4.3 billion appropriation will fund electrification rebates for single- and multi-family homes. The bill also extends the tax credits for residential energy efficiency improvements and new efficient home construction and increases the maximum deduction for energy efficient commercial buildings. A $837.5 million appropriation will be used by the Department of Housing and Urban Development (HUD) for resiliency, energy efficiency, renewable energy, and grid integration projects at public housing units.

[6] For additional information, see ACEEE Building Policies and Codes.

[7] Energy efficiency includes a multitude of measures to reduce energy consumption. These measures range from behavioral changes to installing energy efficient appliances to full building renovations, including updating a building's envelope.

Policymakers in Georgia can consider a variety of policies to encourage energy efficiency and beneficial electrification:

Energy Efficiency Policies

1. **Building Codes** – The DOE projects that, over time, improvements in building codes can have the greatest single impact on energy efficiency within the built environment. On average, commercial buildings waste 30% of energy used.[8] Because buildings will be around for generations, energy efficiency within the built environment is a matter of statewide and long-term importance. States can set requirements for energy systems, require statements of energy use, and set performance standards for energy use or emissions. Building codes can be required by state legislation or implemented through 'home rule', where local governments set their own standards or adopt more strict building codes than those mandated by the state.

   As home rule state, the Georgia Department of Community Affairs (DCA) has adopted, as mandatory minimum building energy code, the International Energy Conservation Code (IECC) 2015 Edition, with amendments. The state has also adopted the National Green Building Standard, 2008 Edition, with Georgia Amendments, as part of the permissive building codes that local governments can choose to adopt and enforce.

   The IIJA includes a $225 million appropriation for a competitive grant program to support the "sustained cost-effective implementation of updated building energy codes." The grant program will run for five years, through fiscal years 2022 – 2026. In December 2022, DOE issued the Resilient and Efficient Codes Implementation Funding Opportunity Announcement to support the adoption of updated building energy codes. Approximately $45 million is available for this competitive grant program. The program requires the participation of a "relevant state agency" and projects must be tied to "an updated building energy code."

2. **Appliance Efficiency Standards** – Appliance efficiency standards set minimum requirements for efficiency in everything from water heaters to washing machines. Efficiency standards save consumers money on utility bills and reduce energy demand on the grid, most importantly reducing peak energy demand. Some states have elected to adopt the federal appliance standards that were in effect on January 1, 2017.[9] These include, among other things, standards on metal halide lamp fixtures, residential furnaces and boilers, and external AC to DC power supplies.

3. **Energy Saving Performance Contracts (ESPCs)** – ESPCs are a financing mechanism for energy efficiency upgrades. ESPCs are often used within large institutions, such as college or government campuses, allowing them to meet their energy and environmental goals. An energy service company will pay the upfront cost of efficiency upgrades and execute the project, often guaranteeing the projected energy savings. The large institution will then pay back the service company with savings from their utility bills. This allows institutions to pay for their upgrades from their operating budget, instead of finding new financing, such as loans or bonds, for capital upgrades. Essentially, they pay their upgrade costs with their energy savings. In 2014, the Georgia Environmental Finance Authority (GEFA) prepared a Guaranteed Energy Savings Performance Contracting State Agency Manual as a guide for Georgia state agencies interested in entering into ESPCs. GEFA has also established a list of pre-qualified vendors and offers model contracts.

4. **Low-Income Energy Efficiency Programs** – While equity should be incorporated into all policy development, it is often necessary to ensure that specific programs are targeted towards historically underserved populations. Recent research suggests that weatherization improvements can reduce energy use by 25-35%, allowing households to reduce their financial energy burden. The federal WAP program provides energy efficiency upgrades for income qualified homeowners. However, there might be difficulty in reaching individuals who are eligible. Policymakers might require outreach and education programs targeted at eligible groups.

   Georgia's LIHEAP program currently offers assistance with energy bill payment, energy crises, and long-term residential weatherization.

[8] For more information, see the Office of Energy Efficiency & Renewable Energy's Commercial Buildings Integration (CBI) Program.

[9] Based upon research conducted by the Center for the New Energy Economy.

5. **Energy Efficiency Resource Standards (EERS)** – EERSs require utilities to demonstrate a reduction in energy demand from programs offered to their consumers. Because this means selling less energy and reducing revenues, there is not always an incentive for the utility to make their consumers more productive or efficient users of energy. If legislatures want to ensure a more productive and efficient energy distribution system that takes advantage of the latest technological innovations, they may want to require that a utility demonstrate a percent reduction in demand through efficiency or "demand side" programs. Legislators can also instruct their utility commissions to consider energy efficiency when approving rate cases by allowing cost-recovery of energy efficiency improvements through utility bills.

   In 2010, in an order approving a stipulation agreement and Georgia Power's IRP, the PSC adopted a resolution recognizing energy efficiency as a priority resource.

6. **Revenue Decoupling and Performance-Based Incentives** – Utilities earn revenue by selling energy. As a result, there is little to no incentive for them to promote energy efficiency because it leads to a reduction in sales, and therefore a reduction in revenue. Revenue decoupling disconnects revenue from the amount of energy sold. This provides utilities a set amount of revenue regardless of the amount of energy sold. While this does not directly incentivize energy efficiency, it does remove the inherent disincentive to promote energy efficiency.

   Incentive policies can be layered on top of a decoupling policy. For example, if a utility meets set energy reduction targets, then performance-based incentives can provide monetary rewards for meeting those targets. Georgia Code (O.C.G.A. § 46-3A-9) authorizes an energy efficiency performance incentive for electric utilities.

Electrification Policies

1. **Strategically Target Beneficial Electrification** – Target areas of beneficial electrification in buildings include space and water heating systems and other systems and appliances that typically use natural gas or another fossil fuel as an energy source. According to the Environment and Energy Study Institute, new electric heat pump technology can heat space and water at efficiencies of 200 to 300 percent, compared to 67 percent efficiency in typical Energy Star gas water heaters.[10] This not only allows savings on energy bills, but it also results in reduced GHG emissions and improved indoor air quality.

2. **Adopt Tools for Advancing Electrification** – Building codes and financial incentive programs can be used to advance beneficial electrification. While in some states, local governments are primarily responsible for adopting and implementing building energy codes, in other states, a state legislature, or a code commission tasked by the legislature, adopts and implements statewide standards. Incentive programs established and implemented by states, local governments, or utilities can target replacing systems and appliances that traditionally rely on fossil fuel resources with high efficiency electric systems and appliances including water heaters, furnaces, ovens, and ranges. As an example, heat pump water heaters and space heating systems can serve as high efficiency replacements for traditionally fossil-based equipment. In conjunction with utility regulatory policy, these technologies can also serve as demand response tools.

   As a note, cities across the country are implementing new building codes promoting beneficial electrification by limiting or banning the installation of natural gas in new construction. State legislatures can pass enabling legislation, allowing municipalities to make independent decisions on beneficial electrification. On the other hand, some states have adopted pre-emptive legislation, banning local governments from adopting policies that limit utility service.[11]

Programmatically, there will always be greatest benefit by combining measures – incentives that bundle improvements will generate greater gains than individual measures. For example, a high efficiency heat pump will be much more effective and efficient when coupled with improved building insulation. Rather than only realizing the gains of the new mechanical component, this combination of measures will increase the efficiency of the entire system.

[10] For more information, see EESI's Beneficial Electrification.
[11] See: "States That Outlaw Gas Bans Account for 31% of U.S. Residential/Commercial Gas Use." S&P Global, 9 June 2022. Available: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/states-that-outlaw-gas-bans-account-for-31-of-us-residential-commercial-gas-use-70749584

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

Bloomberg New Energy Finance estimates that nearly 80% of new car sales in the U.S. will be electric by 2040. Therefore, a key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of electric vehicles (EVs) to the grid. One of the most important barriers to increased adoption of EVs is the consumer's awareness of the availability of EV charging stations. Ultimately, drivers want to be sure that their car will get them where they need to go. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased this "range anxiety."

ACEEE publishes a State Transportation Electrification Scorecard that evaluates states' progress in electrifying transportation in six key policy areas and offers nationally applicable policy recommendations. Georgia ranked 32nd out of the 33 states evaluated in this report.

Georgia is among the top 10 petroleum-consuming states in the nation, and transportation accounts for approximately 90% of in-state use. The state does not offer incentives for citizens to purchase EVs. Georgia requires an additional annual registration fee of at least $210.87 for alternative fuel vehicles (AFVs) with an AFV license plate. This disincentivizes the purchase of EVs and other AFVs. However, AFVs are exempt from tolls and occupant requirements in high occupancy vehicle (HOV) lanes. The state also offers businesses a tax credit for installing EV charging infrastructure. Georgia Power offers a rebate to homeowners that install a level 2 charging station and a reduced plug-in electric vehicle charging rate for charging between 11pm and 7am. The Georgia Department of Economic Development administers the Electric Mobility and Innovation Alliance to support the growth of the "electric mobility industry" in the state which includes a wide range of personal, commercial, agricultural , and public transit oriented electric vehicles.

The IIJA provides nearly $5 billion over the next five years to support the electrification of the transportation sector. In 2022, $615 million was made available for the installation of charging stations along designated alternative fuel corridors through a new National Electric Vehicle Infrastructure (NEVI) formula grant program. To be eligible to receive this funding, states must have submitted a NEVI plan to the Federal Highway Administration (FHWA) by August 2022. All 50 states plus D.C. and Puerto Rico submitted a NEVI plan. Georgia will receive an estimated $28,749,059 in Fiscal Year 2023.

The Act also provides approximately $1.1 billion for grants to state and local governments to assist with the purchase or lease of low- or no-emission vehicles for transportation fleets. To be eligible, a state must have a Zero-Emission Fleet Transition Plan in place.

The IRA extended the $7,500 EV tax credit for purchases of new plug-in EVs through 2032 and removed the eligibility cap based on number of vehicles sold by manufacturers. The Act includes requirements for material sourcing that must be met by manufacturers starting in 2027. The IRA also created a new $4,000 refundable tax credit for the purchase of used EVs and a new credit for commercial EVs. Appropriations in the Act include $1 billion for replacing medium- and heavy-duty vehicles with EVs, $3 billion to fund projects to reduce transportation sector emissions, and $3 billion to procure AFVs for the federal fleet.

There are several policy opportunities to encourage increased market penetration of EVs Georgia, including:

1. **Utility Investment in "Make-Ready" Infrastructure and Utility-Run Programs** – "Make-ready" means building and upgrading the infrastructure necessary for the installation of a charging station. RMI recommends that policies providing incentives for utilities to invest in make-ready infrastructure or charging infrastructure itself should be performance-based and encourage investments in locations that are unlikely to be targeted by the private sector, such as low-income and multi-unit dwellings. Additionally, utilities can incentivize EVs by incorporating charging rate incentives and time of use rates to reduce the cost of electricity used for charging. Eligibility for a charging rate incentive may be limited to users with separate or advanced metering systems. Some utilities also offer financial incentives for the purchase of EVs or EV charging equipment. In some states, enabling legislation might be required to direct or authorize a public utilities commission to allow regulated utilities to recover the costs of providing these incentives.

2. **Parking Infrastructure Requirements** – In tandem with the implementation of Georgia's NEVI plan, legislation could set requirements for parking lots and other infrastructure. Some states have adopted permitting standards

for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop make-ready locations. Georgia's Building Energy Codes could also be updated to include requirements for EV charging infrastructure.

3. **Rental Properties and HOAs** – Legislation can also make it easier for lessees, renters, and members of a homeowners' association (HOA) to install charging equipment. Typically, lessors are directed to allow lessees, at their own cost, to install charging systems. In some cases, lessees are required to maintain additional insurance for the system. Legislation related to HOAs typically directs these organizations to avoid restrictions that would inhibit the installation of charging equipment.

4. **EV and Charging Equipment Financing and Financial Incentives** – Providing financial incentives and innovative financing options can help spur greater market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing the high up-front costs of EVs and EV charging equipment. While sales tax credits are typically applied at the time of purchase, property and income tax credits may do less to address upfront cost barriers, as the credit is not applied at the time of purchase.[12] States have adopted other financial incentives including low-interest loans, grants, vouchers, and rebates. A handful of states qualify EV charging equipment under their property assessed clean energy (PACE) programs. A simple solution is to increase and expand existing tax credits to incentivize commercial, publicly available charging stations.

   States might consider adopting programs to incentivize the purchase of used EVs. With increasing battery capacities and falling prices, there are an increasing number of EVs with relatively low mileage that are being traded in. States might also consider programs that target low- and moderate-income (LMI) customers that may not qualify for a loan directly. Such a program could facilitate sales through such things as loan loss reserve and interest buy down programs.

5. **Fleet Mandates** – Some states require state agencies to acquire a fixed or growing percentage of electric, hybrid, and/or alternative fuel vehicles. For instance, Massachusetts required that its state fleet be no less than 50% hybrid or alternative fuel vehicles by 2018 and set the following state fleet targets for zero emission vehicles (ZEVs): 5% by 2025; 20% by 2030; 75% by 2040; and 100% by 2050. A City of Seattle study found that the city could save millions by switching to EVs.

6. **Federal Congestion Mitigation and Air Quality (CMAQ) Funds** – CMAQ funds (almost $2.6 billion in fiscal year 2023) are available to states to assist them in meeting Clean Air Act requirements. State funds can be used to deploy EV charging infrastructure. There may be a unique opportunity to pair a request for CMAQ funds with a commitment from utilities to invest in charging infrastructure as a public/private partnership that would leverage the federal investment.

NEWS

- August 8, 2023: Stryten Energy and Snapping Shoals EMC Install Georgia's First VRF Battery System
- August 1, 2023: Georgia Power: Vogtle Unit 3 Goes Into Operation
- June 29, 2023: DOE Says Georgia's Clean Energy Sector has Grown; Larger Surge Expected
- June 12, 2023: Form Energy, Georgia Power Continue Forward with 15 Megawatt Iron-Air Battery System Agreement
- June 1. 2023: Optimus Energy Eyes Commercial Solar, EV Charging Expansion in Georgia
- May 26, 2023: LG Energy Solution and Hyundai Announce Battery Facility in Georgia
- May 17, 2023: Energy Assistance Groups Worry about How Rise in Georgia Power Bill Could Impact Low-Income Customers
- March 6, 2023: Low Impact Solar Siting in Georgia
- January 23, 2023: State Officials Unveil Bipartisan Hydrogen Energy Braintrust
- January 11, 2023: Korean Solar Company Plans to Build $2.5 Billion Plant in Georgia

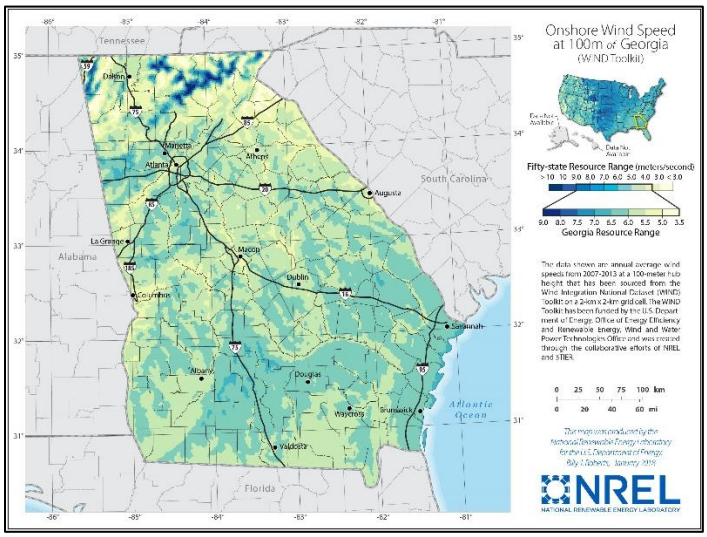
[12] A study by the Congressional Research Service suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

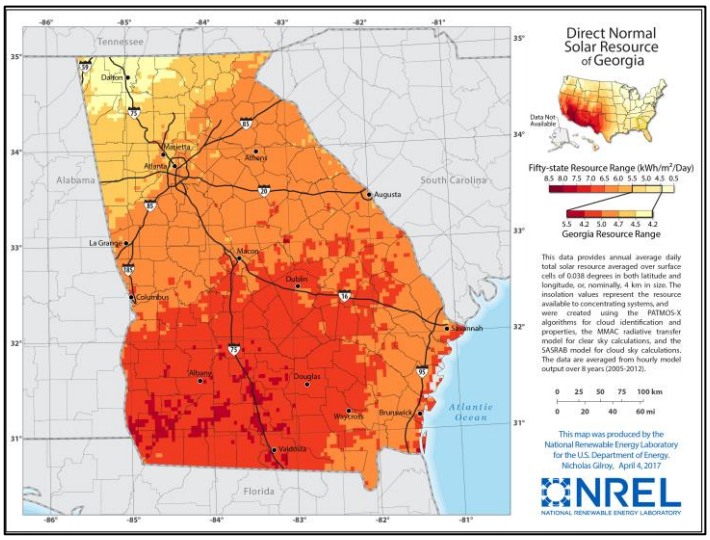
OTHER RESOURCES

- Georgia Environmental Finance Authority: https://gefa.georgia.gov/energy-resources
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Georgia: http://database.aceee.org/state/georgia
- The Database of State Incentives for Renewables and Efficiency, Georgia: https://programs.dsireusa.org/system/program/ga
- U.S. Department of Energy's Alternative Fuels Data Center, Georgia: https://www.afdc.energy.gov/states/ga
- U.S. Energy Information Administration, Georgia: https://www.eia.gov/state/?sid=GA
- American Clean Power Association State Fact Sheets: https://cleanpower.org/facts/state-fact-sheets/
- SPOT for Clean Energy, Georgia: https://spotforcleanenergy.org/state/georgia/
- Conservatives for Clean Energy Georgia: https://cleanenergyconservatives.com/states/georgia/
- Southern Alliance for Clean Energy: https://cleanenergy.org/
- Southeastern Wind Coalition: https://www.sewind.org/

GEORGIA'S WIND AND SOLAR RESOURCES

WIND: https://windexchange.energy.gov/states/ga





Our Resources

CNEE Homepage: https://cnee.colostate.edu/

The SPOT for Clean Energy: https://spotforcleanenergy.org/

The Advanced Energy Legislation (AEL) Tracker: https://www.aeltracker.org/

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