

SC NEXUS OVERARCHING NARRATIVE

A. Executive Summary

The SC NEXUS for Advanced Resilient Energy will mobilize \$75M in EDA funds, \$11.2M in partner matches, and \$76.0M in partner investments to establish the tech hub as a globally-leading advanced energy (KTFA 9) hub for cyber-secure grid resilience technologies (GRTs). Marshalling a 52-member consortium from the region’s Midlands and Upstate regions, SC NEXUS will contribute to economic and national security goals by expanding the availability of GRTs and removing barriers to their commercialization; enabling greater deployment of distributed energy resources (DERs) that will fortify energy supplies, promote decarbonization, and reduce grid disruptions; and training the workforce necessary to enable the above. By initially focusing on battery (BESS) and hydrogen energy storage systems (HESS) and their components— together representing a \$752B (2030) global market growing at an annualized 15%—the consortium expects to support ~28,000 jobs and generate \$5.7B+ of additional economic output throughout the region by 2034.

SC NEXUS will deliver this transformation via six interconnected projects that will reduce GRT development costs and accelerate commercialization. The projects will establish a network of third-party-accessible testing and demonstration facilities, along with ecosystem-level initiatives that lower entry and growth barriers for GRT entrepreneurs and increase supply of GRT workers. Programming will impact many of the region’s underserved communities and bring intentional focus to “Community Anchor” counties of Allendale, Bamberg, Barnwell, Orangeburg, and Union—[five of the nation’s most economically distressed communities](#). Situated amidst the region’s world-class research, manufacturing, and logistics assets, SC NEXUS will achieve global competitiveness in GRTs by 2034.

B. Synopsis of SC NEXUS

The SC NEXUS consortium comprises 52 organizations (see table below), all committed to making SC NEXUS a global leader in GRTs by 2034. SC NEXUS defines GRTs as the distributed energy resources (DERs) and integration/management tools that 1) enhance the reliability, adaptability, and stability of electrical grids, and 2) enable dependable, cybersecure power supplies capable of withstanding and rapidly recovering from disruptions. Specific GRTs—for both grid-scale and behind-the-meter (BTM) use cases—include but are not limited to energy storage systems (e.g., battery and hydrogen energy storage systems, or BESS and HESS), power electronics (e.g., inverters, converters), and microgrid-enabling technologies (e.g., PV solar, demand response software).

Member Type	SC NEXUS Consortium Members
Industry groups or firms (24)	Amentum, Bedrock Ventures, BMW, Bosch, Central Electric Power Cooperative, Inc. (CEPCI), Cirba Solutions, Denkai, Dominion Energy, Duke Energy, Enersys, e4 Carolinas, Fraunhofer USA, IBM, Kyocera AVX, Lockhart Power, Pomega, Resilient Power, Rolls-Royce , Santee Cooper*, Schneider Electric, Siemens, Soteria, Southern Company, Tetramer
Economic development organizations (6)	Applied Research Center, Inc., Savannah River Site Community Reuse Org. (SRSCO), SC Association for Community Economic Development**†, SC Competes*, SC Research Authority (SCRA)* , Southern Palmetto Regional Chamber†
Workforce org. (2)	SC Dept. of Employment and Workforce*, SC Technical College System (SCTCS)*
Institutions of higher education (5)	Augusta University, Benedict College† (HBCU), Clemson University* , South Carolina State University**† (SCSU; HBCU), University of South Carolina (USC)*
Venture development orgs (10)	3PhaseSC , Business Development Corporation (BDC), CoreSC, InvestSC, Hi-Mark Capital, NextGEN, Palmetto State Growth Fund, SC Jobs-Economic Development Authority (JEDA), SC Launch, Inc., VentureSouth
State and local gov. (3)	SC Commerce* , SC Army National Guard, SC Department of Education*
National lab (1)	Savannah River National Lab (SRNL)*
K-12 (1)	Governor’s School for Science and Mathematics, <i>SC Department of Education (counted above)</i>

Bold = Project lead, * = Principals Committee, † = Organizations representing perspective of underserved communities

SC NEXUS has also developed partnerships with the U.S. Army Cyber Center of Excellence and the U.S. Army Cyber Command, both located at Fort Eisenhower, Georgia.

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SC NEXUS' inaugural set of projects consist of four technology projects (see CIBI, H₂RDT, EDGE, GECO below), which will provide third-party accessible testing, development, and demonstration infrastructure. Together these will reduce product development costs and timelines, de-risk GRTs for users, and increase the likelihood of commercialization. Two complementary projects (see eiX and EWC below) will strengthen the talent pipeline of skilled technicians, engineers, and entrepreneurs into the GRT ecosystem and enable long-term GRT growth in the South Carolina and Georgia counties comprising SC NEXUS' geography.

- **The Carolina Institute for Battery Innovation (CIBI):** USC will expand pilot manufacturing infrastructure to accelerate innovation and commercialization of BESS at reduced costs and with improved features (e.g. faster ramp rates, higher densities). CIBI will partner with SCTCS to develop first-of-its-kind BESS workforce programming at non-degree and degree-granting levels. The pilot manufacturing line will be operational by Jan. 2026. Pomega, Soteria, and Den kai have committed to use the equipment to accelerate commercialization of their GRT components.
- **H₂ Resilience Demonstrator and Testbed (H₂RDT):** Rolls Royce anticipates working with experienced third parties—such as Amentum and the Applied Research Center (ARC)—to construct a replicable modularized HESS at its Aiken campus for H₂ firms to affordably demonstrate and test HESS components. Construction is expected to be completed by Jan. 2027. Bedrock, Bosch, and Tetramer have committed to use the facility to demonstrate their storage, electrolyzer, and converter technologies.
- **Economic Development through Grid Emulation (EDGE):** An upgrade to Clemson's existing eGRID testing facility for GRTs will create a versatile, reconfigurable, and mobile 25MW test facility and real-time power grid emulator. The upgraded facility will enable life cycle and multi-standard compliance testing for DER technologies, allowing firms to test in the region. Upgrades will be complete by Oct. 2026.
- **The Grid Enabled Cyber Operations (GECO) Range:** Utilizing its cyber test range and supply chain risk management (SCRM) expertise, SRNL will 1) develop a full-scale multi-modal grid operations center to conduct cyber-physical assurance on grid hardware and software, and 2) train grid cyber defenders. Cyber training and SCRM will begin in Oct. 2025, with the range fully operational by Jan. 2026.
- **The Entrepreneurship & Innovation eXchange (eiX):** SCRA—in partnership with the region's national lab, venture development organizations, and capital providers—will support the region's GRT entrepreneurs and businesses by intentionally connecting them to mentorship, subject matter experts, and IP; providing comprehensive training to launch and grow their businesses; and increasing capital formation, deployment, and access. eiX's Community Anchor satellite "spokes" will launch in Mar. 2025 with the first cohort of the accelerator program launching in Dec. 2025.
- **The Education & Workforce Center (EWC):** SCTCS—in partnership with GRT employers, K-12 and higher education institutions, and community organizations—will house initiatives that elevate citizen awareness of GRT careers, advance current and future GRT workers' technical and soft skills, and address the lack of critical support services to workforce engagement (e.g. childcare, transportation). The EWC partnership was initiated in Jan. 2024, with programming slated to begin in Summer 2025.

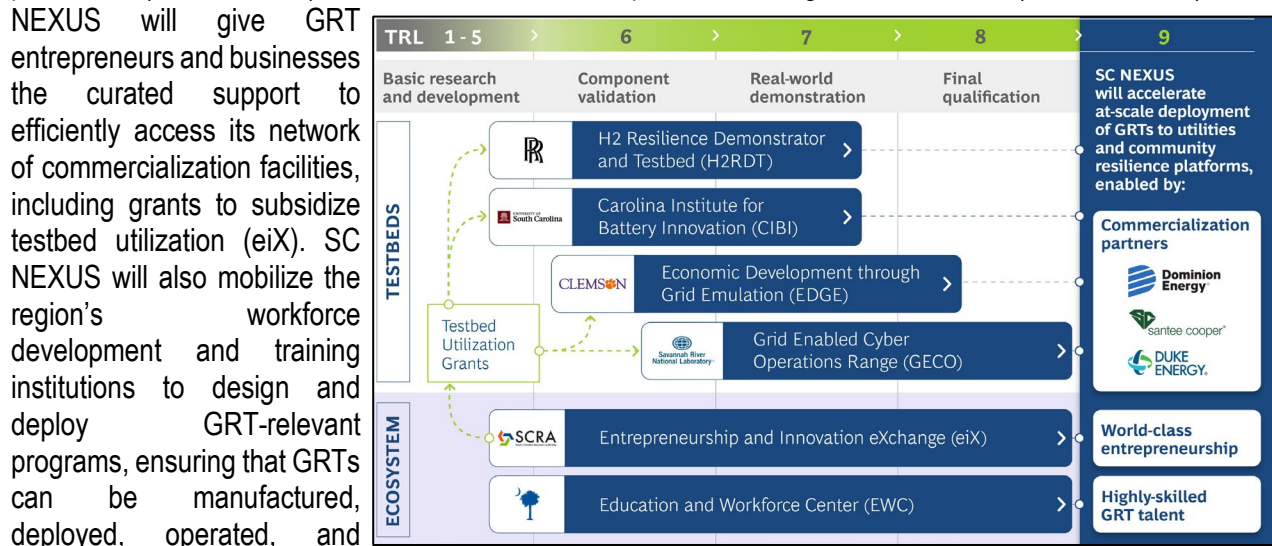
These projects will strengthen national security and position the U.S. as a global leader in GRTs by accelerating commercialization of GRT components to Technology Readiness Level (TRL) 9, connecting entrepreneurs and businesses to critical resources, and training a workforce to manufacture, deploy, and operate GRTs. SC NEXUS projects the combined direct economic output of CIBI, H₂, EDGE, and GECO at \$5.7B over project implementation (IMPLAN; projects calculated individually) and potentially higher as eiX brings new technologies to market. To enable this, EWC will train/upskill 28k+ GRT workers, supporting jobs in key technologies (e.g., ~4.2k BESS jobs, ~6k GRT manufacturing jobs) representing ~\$2.8B in labor income (IMPLAN). In total, SC NEXUS expects to capture \$10B+ of the \$752B global opportunity in its technologies.

SC NEXUS has secured 154 investment and policy commitments from 67 organizations to reduce barriers to GRT commercialization and deployment. Commitments from 19 industry partners demonstrate

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strong private-sector interest in utilizing testbeds. Six utilities will support GRT commercialization, seven firms will lead the EWC’s Employer Collaborative, and seven organizations and venture firms will establish the eiX Capital Network to fund GRT entrepreneurs. These are complemented by \$17.4M in commitments from higher-ed/nonprofit partners, a bipartisan strongly-supported state appropriation of \$40M in one-time and \$10M in recurring funding for project development and operations, and five authentic partnerships with organizations representing SC NEXUS’ high-need Community Anchors. Further details below in Section E.

These commitments will support SC NEXUS’ integrated projects, allowing SC NEXUS to overcome constraints limiting global GRT leadership, high market entry barriers, risk aversion among GRT users, inadequate testing and demonstration infrastructure, and an undersized skilled GRT workforce. SC NEXUS’ network of commercialization facilities will enable GRT developers to fine-tune component manufacturing processes (CIBI, H2RDT) and demonstrate tech capabilities in a grid environment (EDGE, GECO). SC NEXUS will give GRT entrepreneurs and businesses the curated support to efficiently access its network of commercialization facilities, including grants to subsidize testbed utilization (eiX). SC NEXUS will also mobilize the region’s workforce development and training institutions to design and deploy GRT-relevant programs, ensuring that GRTs can be manufactured, deployed, operated, and maintained in the region (EWC). Developers, too, will utilize SC NEXUS facilities confident that each is precisely aligned to the needs of potential customers (e.g., Dominion Energy, Duke Energy, Santee Cooper).



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SC NEXUS’ dedication to accelerating commercialization of GRTs demonstrates a commitment to deliver progress on national priorities for climate and environmental sustainability. GRTs have clear applications in grid-scale (e.g., utilities) and site-specific power (e.g., industrial and defense installations), both of which are drivers of U.S. greenhouse gas emissions (25% and 24%, respectively). Deploying renewable energy is a critical step in reducing emissions, but challenges in the consistency of these energy sources will hinder scale—unless addressed by GRTs. SC NEXUS will deliver these technologies within the next ten years.

The consortium will target programming in the region’s most distressed communities, with an initial focus on Allendale, Bamberg, Barnwell, Orangeburg, and Union counties (referred to as “Community Anchors” in the SC NEXUS geographic region). Each of these five counties is classified as distressed, with high levels of poverty (20-28%) and adult unemployment (24-48%), and low educational attainment (14-23% of population without a high school diploma). Three of these counties are minority-majority, including two of the most distressed (Allendale and Bamberg); Barnwell, Orangeburg, and Union counties have all become more distressed since 2000, bucking state and national trends. Leading this effort is SC NEXUS’ Regional Innovation Officer, Fearn Gupton, whose expertise in rural community development will inform initiatives that connect residents to high-growth-potential GRT jobs and provide commercialization support for local entrepreneurs and small-scale manufacturers (SSMs).

The connectivity of the six projects and partner commitments will enable SC NEXUS to achieve outcomes that are local—new local jobs, businesses, and economic growth—and national, increasing the U.S.’ economic competitiveness in a critical global market, expanding its leadership in clean energy, and securing

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supply chains currently dependent on foreign adversaries. Through its projects, by 2034 SC NEXUS expects to create at least 28k grid resilience jobs, earning a 40% wage premium relative to average wages in SC NEXUS’ geography. The region will also capture \$10B of the global grid resilience market, attracting \$1B in GRT-relevant foreign direct investment (FDI) and generating \$3-5B in GRT-related exports. Detailed outcome metrics can be found in Section J below and Section 5 of each project application.

The table below details SC NEXUS’ expected timeline for implementation. The consortium will launch as a new division of SC Commerce in Mar. 24, immediately preparing to launch its six projects. The H2RDT, the sole proposed construction project, is scheduled for completion in Jan. 2027, with upgrades and equipment installations for the GECCO, CIBI, and EDGE facilities completed by Oct. 2026 or earlier. All four SC NEXUS testbed facilities will be fully operational by Oct. 2026. This accelerated delivery timeline ensures EDA investment reaches GRT developers and communities as quickly as possible. While facilities prepare for operations, EWC and eiX will begin workforce and entrepreneurship programs to generate a steady supply of facility users and workers ready to deploy these technologies.

Project	Major Milestone (assumes Oct. 1, 2024 award date)	Date
Commerce	SC NEXUS division established	March 2024
EWC	Grid resilience Employer Collaborative established	Jan 2024
	Mobile engagement lab launched	June 2025
	Childcare entrepreneur support begins	Sept. 2025
	Mobile grid skills training lab launched	Sept. 2025
eiX	eiX Resource Platform launched	Mar. 2025
	“Spokes” in Community Anchors established	Mar. 2025
	Cohort I of grid resilience accelerator launches	Dec. 2025
GECCO	Cyber training and SCRM assessments operational	Oct. 2026
	Upgraded cyber testing range operational	Jan 2026
CIBI	Digital twin operational	Nov 2025
	2-year SCTCS degree in BESS approved	Dec 2025
	Pilot battery manufacturing line operational	Jan 2026
EDGE	Upgraded testbed operational	Oct. 2026
H2RDT	H2 testbed operational	Jan. 2027

C. Technological or other problems slowing technology advancement

A more resilient grid is dependent on the availability of new energy technologies that increase efficiencies and introduce new methods for energy generation, transmission, and storage. Four barriers hinder the advancement of GRTs: 1) high market entry barriers for energy firms of all sizes; 2) risk aversion among tech users; 3) inadequate testing and demonstration infrastructure; and 4) an undersized skilled GRT workforce.

The unique features of the energy sector—including significant upfront investment, long R&D processes, and strict regulatory requirements—increase market entry barriers to commercialize new GRTs. The features also increase product development costs, requiring firms to have significant resources on-hand to maintain operations during review and procurement processes, and raise the importance of de-risking GRTs for key customer segments (e.g., industrial users, defense installations). Utilities, for example, often face conflicting regulatory mandates to provide a reliable energy supply, reduce risk of future supply disruptions, and shift toward grid decarbonization. Behind-the-meter industrial and defense clients face fewer regulatory hurdles, but are less likely to deploy a technology without being certain it meets the needs of their use-case. This is a common challenge for HESS commercialization, which has potential to offer compelling benefits (e.g., storage longevity) but can be perceived as riskier than more developed BESS technologies.

Another challenge for GRT firms is the lack of infrastructure to test and demonstrate how technologies can operate within or separate from integrated energy systems. Successful GRTs must integrate with ecosystems that mix legacy and new technologies; improve system performance by reducing disruptions and increasing efficiencies; and meet safety and performance standards. These require GRTs to prove capabilities prior to at-scale deployment, compounding perceived risk for customers.

De-risking GRTs also goes beyond technical considerations: it demands a trained and skilled workforce able to install, operate, maintain, and decommission GRTs. While GRTs share complementarities with existing grid technologies, specific GRT considerations (e.g., integration of BESS with existing infrastructure)

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require workers to acquire a new set of skills through new education/training pathways and/or upskilling.

Bringing GRTs to market will require coordination across ecosystem players: utilities, regulators, innovators, academia, workforce organizations, government. SC NEXUS will fulfill this role with partners who are committed to mitigating the identified barriers to GRT commercialization. SC NEXUS' testbeds will reduce tech development and demonstration costs, lowering market entry barriers for firms and demonstrating to potential customers that GRTs can safely and effectively meet their needs. Simultaneously, SC NEXUS will cultivate the enabling environment for GRTs by connecting energy entrepreneurs to critical resources and by working with K-12, vocational, and higher education institutions (HEI) to train a world-class GRT workforce.

D. The Nexus of KTFA #9 Advanced Energy, the Hub's chosen geography and assets, national and economic security, and the connection to economic competitiveness/competitive advantage

The [U.S. National Security Strategy](#) identifies three goals to strengthen economic and national security: 1) implementation of a modern industrial and innovation strategy; 2) global leadership in climate change solutions; and 3) a military capable of outcompeting and deterring adversaries. Furthermore, [Executive Order 14017](#) emphasizes resilient supply chains in key technologies. SC NEXUS supports these national goals by mitigating grid disruption effects, fostering GRT expertise, and protecting energy infrastructure.

Consuming ~25% of U.S. energy, manufacturing faces regular power disruptions affecting safety and productivity. [Firms reported in 2021](#) a high level of outage frequencies (44% experiencing at least one outage/month) and incurred measured costs (22% reporting costs >\$100K/outage). In SC NEXUS' region, where manufacturing is a core industry, GRTs offer solutions through enhancing reliability, creating jobs, driving economic opportunity (est. \$752B value in 2030), and reducing reliance on foreign energy technology, particularly from China, which leads global manufacturing capacity for clean energy tech such as batteries (60% of cell production), fuel cells (65% of proton-exchange membrane cells), and electrolyzers (40%).

GRTs will also enhance the resilience of essential services in rural areas, military installations, and emergency facilities (e.g., hospitals), enabling key facilities to act as "islands" in the face of both local and cascading outages. Home to [seven military installations](#) and a large rural population ([32% of South Carolina's total population](#)), SC NEXUS' geography is in a competitive position to lead not only GRT development, but also the deployment and demonstration of GRTs as a practical solution. SC NEXUS, active in counties with frequent outages and vulnerable populations (e.g., Greenville, Anderson, Oconee, Laurens, Aiken, Lexington, Cherokee, and Sumter), which [research](#) shows to be strongly correlated, will promote energy autonomy, aiding these counties directly and serving as a model for similar communities nationwide.

SC Commerce has successfully established hubs for industries including aerospace (e.g., Boeing, Lockheed Martin) and automotive (e.g., BMW, Mercedes-Benz, Volvo). In 2022 alone, SC Commerce secured \$3.8B in capital investment in SC NEXUS' geography. The state's commitment to GRTs represents its next strategic focus in economic development. This track-record and the following assets represent SC NEXUS' strong competitive advantage as a GRT Tech Hub:

- **Partnership-driven Development Approach.** SC NEXUS is supported by many engaged partners, including utilities like Duke and Dominion—the 6th and 9th largest utilities in the U.S.—and local providers like Santee Cooper and Central Electric Power Cooperative. The consortium also includes the region's largest manufacturers (e.g., BMW, Bosch), leading HEIs, and entrepreneur support organizations.
- **Advanced Manufacturing Base.** The SC NEXUS region accounts for 66% of the state's manufacturing footprint. Manufacturing represents 13% of the state's GDP, highlighting the concentration of both large (e.g., BMW, GE Vernova) and small-scale manufacturing operations (e.g., Pomega).
- **Industry-Aligned Workforce Development.** The region's workforce development ecosystem includes highly-connected K-12, vocational, and HEIs that already meet the demands of rapidly growing industries (e.g., EVs, aerospace) with renowned training programs like [ReadySC](#), [Apprenticeship](#)

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[Carolina](#), and a technical college system geographically accessible to every citizen (<30 min. drive)—and curriculum, internship, and apprenticeship programs offered in close partnership with employers.

- **Foundational GRT R&D Assets and Programming.** South Carolina’s R1 institutions have a track record in technology advancement. Since 2018, USC has transitioned 33 engineering technologies to industry; Clemson has spawned 19 startups and issued 64 patents between 2015-20. South Carolina’s firms have secured [\\$130M in SBIR/STTR funding since 2015](#). Clemson’s Dominion Energy Innovation Center, USC’s Center for Electrochemical Engineering, and SRNL’s defense-grade cyber operations ranges provide additional assets to support GRT technologies’ journey from the lab to the marketplace.

E. Private sector participation

The private sector is embedded in SC NEXUS, representing over 50% of consortium members (start-ups to large multinationals). Their participation ensures that technology maturation efforts are backed by at-risk capital and that workforce development programs are tightly linked to the positions and skills employers are seeking. This engagement secured significant contributions from the private sector—\$8.5M in investment, nearly \$3.7M in match, and 61 policy commitments from 38 firms—including:

- **Utilizing testbeds:** 19 firms have commitments or demonstrated interest in utilizing SC NEXUS’ testbed facilities (CIBI, GECO, EDGE, H2RDT) to accelerate the commercialization of GRTs, including inverters (e.g., Solectria), transformers (e.g., Resilient Power), EV chargers (e.g., ABB E-Mobility), BESS (e.g., Pomega, Siemens), battery components (e.g., Soteria), hydrogen generation technologies (e.g., Bosch, Tetramer), and converters (e.g., WEG). These commitments will drive significant revenue from testbed user fees and establish the need for and financial sustainability of the proposed facilities.
- **Providing commercialization opportunities:** All six of the hub’s regional utilities (Duke, Dominion, Santee Cooper, Southern Company, Lockhart Power, Central Electric) and Southern California Edison have committed to engage with testbeds. Involvement from utilities provides testbed users the confidence that early-stage products (TRL 6) have a path to commercialization (TRL 9). Utilities will help define the technical specifications and certification protocols to ensure alignment with regulations; provide real-time grid performance data, enabling testbeds to better emulate real-world scenarios; connect OEMs with testbeds; and test local microgrids with mobile equipment, accelerating interconnection of DERs.
- **Participating in an employer collaborative:** EWC launched an employer collaborative in Jan. 2024 led by Santee Cooper, Duke Energy, Dominion Energy, Siemens, Cirba, Kyocera, and Pomega. The collaborative will regularly convene to identify essential roles and skills and jointly develop employer-connected initiatives. In doing so, the employer collaborative will activate hands-on training programs, apprenticeships (e.g., SCSU’s internship program for HBCU students), and hiring commitments.
- **Supporting entrepreneurship and business development:** Five venture partners have committed to being initial members of the eiX capital network, together representing over \$5B in assets under management. SC Launch Inc., Venture South, and Palmetto State Growth Fund will provide access to dilutive funding, and Hi-Mark Capital will invest in BIPOC and women entrepreneurs and businesses via an aggregate fund that includes Bank of America, Mitre Engenuity, and Eagle Capital Management.

F. Commitments from state, local, or other government sources

The state of South Carolina, community organizations—particularly from Community Anchors—and multiple nonprofit organizations have made significant commitments to SC NEXUS. These commitments—69 policies, \$7.5M in match, and \$67.1M in investments from 25 entities—will promote its success by:

- **Providing startup and recurring funding to support project development and operations:** Governor Henry McMaster pledged state support for SC NEXUS in his [2024 State of the State Address](#), committing support for appropriation of \$40M in one-time start-up funding and \$10M in annually recurring funding to

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support six staff and the hub's core ongoing operations (hub-wide data platform, cyber security capabilities, and program evaluation services). Support for SC NEXUS has been echoed by General Assembly's [Joint Resolution 912](#), which passed the SC Senate unanimously on February 27th, 2024. Higher education institutions in the consortium will provide \$12.7M+ in equipment, facilities, faculty and staff time, and other in-kind commitments across numerous projects.

- **Establishing authentic partnerships with communities of greatest need:** SC State University (Orangeburg County), USC Union College (Union County), and the Southern Palmetto Regional Chamber (Allendale, Bamberg, and Barnwell Counties) will host eiX satellite “spokes” to connect Community Anchor residents to SC NEXUS opportunities, resources, and training. Partnerships with K-12 schools will enable delivery of EWC programs that raise GRT-career awareness, while partnerships with SCTCS campuses in Community Anchor counties (Midlands Tech, Spartanburg Community College, Orangeburg-Calhoun Tech, Denmark Tech) will deliver GRT vocational training to students.
- **Enabling organizational capabilities necessary for seamless execution:** SC Commerce will house SC NEXUS as a new dedicated division, granting it full access to the ancillary capabilities of the full agency, including communications, compliance, and legal. SC Commerce will oversee and manage the hub's governance structure, including its Principals Committee, the consortium, and connection to project leads. Several other government or public institutions (Clemson, SCRA, ARC, USC) will similarly provide significant project-level oversight and execution support.

G. Plan for self-sustainability

SC NEXUS is positioning itself as a long-term leader in global GRT commercialization, with attention to sustainable financing and organizational governance. Recurring revenue streams from the private sector and ongoing support (\$10M recurring appropriation) from the state will make SC NEXUS financially self-sustainable by 2029, if not sooner. Projects will rely on earned revenue from testbed utilization, as well as on innovative approaches to monetization (e.g., H2RDT selling gaseous offtake to local industry, eiX receiving proceeds from start-ups' follow-on funding). For example, Clemson University's eGRID facility—which will be upgraded to form the EDGE testbed—has previously generated as much as \$400K annually from testbed operations and projects a four-fold increase in this revenue due to EDA-supported upgrades.

SC NEXUS is also ensuring organizational durability. The Secretary of Commerce will oversee SC NEXUS, advised by cross-sector executives appointed to the Principals Committee. The Committee will conduct quarterly strategic reviews and will establish standing and ad hoc working groups on critical topics (e.g., SC Competes leading on Intellectual Property Protection and Technology Control). The Regional Innovation Officer will function as the executive director of the hub's day-to-day operations, reporting to the Secretary, and will soon manage the SC NEXUS division's five full-time employees. The RIO is already overseeing development of a hub-wide data platform to centralize project metrics and outcomes; the regular cadence of performance monitoring will drive continuous improvement, identify opportunities for cross-consortium support, and prompt refinement of SC NEXUS' strategy to achieve global competitiveness.

H. Plan for engagement of labor unions or pursuit of economic benefits for local residents

SC NEXUS champions all residents of its geography, believing that every individual deserves an equal opportunity to pursue work that is safe, fair, and rewarding. (Note that unionization is low in South Carolina, a right-to-work state, at [less than 3%](#)). The GRT workforce includes many occupations (technicians and engineers skilled in electrical, systems protection, line, energy storage, grid and cybersecurity grid), with a total projected ten-year deficit of [600k nationally and 7k in South Carolina](#) alone. These are [Good Jobs](#) at leading companies that compete for workers through inclusive hiring processes, family-sustaining benefits, safe working conditions, and competitive compensation (avg. annual wages at \$77K).

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SC NEXUS will ensure that all South Carolinians can share in the benefits of new economic growth by connecting residents to skilling/reskilling initiatives and addressing access barriers to training and employment (rurality, transportation, childcare, finances). In addition to the local outreach efforts of the EWC and eiX spokes, SC NEXUS will continue a tradition of community outreach events first held in 2015, following Volvo's \$500M investment in South Carolina. SC NEXUS will bring together local industry, residents, and workforce providers to foster community trust and interest, especially in regions with declining legacy industries and the inevitable shifts of automation, globalization, and the clean energy transition. Utilities Santee Cooper and Dominion Energy, for example, have announced plans to close three coal-fired power plants in South Carolina—Winyah Generation Station, Williams Station, and Wateree Station—by 2028, impacting an estimated 821 jobs. SC NEXUS stands ready to support these workers.

I. Plan for equitable distribution of benefits

SC NEXUS will benefit a broad yet tightly-connected geographic region, including 60% of South Carolina's distressed counties, with focus on communities in the region's five most underserved counties: Allendale, Bamberg, Barnwell, Orangeburg, and Union. These "Community Anchors" face greater economic challenges than over 90% of counties nationally, according to the [Distressed Communities Index](#) (DCI). SC NEXUS is committed to fueling innovation, expanding business and entrepreneurship growth opportunities, and ensuring equitable access to [Good Jobs](#) in these counties. Each will receive the following supports:

- **K-12 programming to grow student and family awareness of grid resilience careers (via EWC).** Elementary students will receive standards-based, in-school lessons through EWC's "STEM Days on the Go" program; middle schoolers will be able to attend hands-on GRT "GoSciTech" summer camps.
- **Skills training to equip citizens with technical and soft skills (via EWC)** needed for good-paying GRT jobs, delivered through mobile skills training lab stationed at accessible sites across communities.
- **Business/entrepreneur supports and services (via eiX)**, prioritizing underrepresented entrepreneurs, delivered through community-based spokes, cohort-based training programs, access to capital, and resources (e.g., free access to high-speed internet).

Each county's unique context, needs, and selected opportunities are highlighted below, alongside the differentiated partnerships and programming to be provided through SC NEXUS.

Allendale County is the region's most distressed county (DCI of 99.6), with 22.9% of individuals aged 25+ lacking a high school diploma (vs. 11.5% national average), a 28% poverty rate (vs. 12.8%), 48% of adults not working (vs. 21.4%), a 17.5% housing vacancy rate (vs. 7.8%), a \$32.2k median household income (vs. \$54.3K), and 73% Black/African American population (vs. 14.4%). Differentiated partnerships/programs: Middle school summer camps will be offered in partnership with Denmark Technical College. Community members will also have access to entrepreneurship support through the eiX spoke in neighboring Barnwell county, with focus on combatting the decline in local establishments (-8.2%, 2016-20).

Bamberg County (DCI 91.8) experienced a 10.8% decline in employment from 2016-20; one-fifth of community members lack a high-school diploma. Differentiated partnerships/programs: EWC's partnership with Denmark Technical College will extend to Bamberg County, delivering summer campus to students and providing training pathways for the county's residents without high-school diplomas. Moreover, to ensure potential GRT trainees can access educational opportunities, EWC will invest in childcare providers to expand the availability of affordable childcare in Bamberg County, especially in [childcare desert census tracts](#).

Barnwell County has a DCI of 91.9 and 27% poverty rate, and is proximate of the counties to the H2RDT and GECO project sites. Differentiated partnerships/programs: SRNL's GECO project will collaborate with Barnwell High School to conduct grid cyber-security workshops with 11th and 12th graders, building a pipeline of 500 students annually for GECO's cyber training programs. The EWC will support the expansion of local childcare programs to address childcare barriers facing potential GRT workers. Barnwell will host an eiX

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satellite spoke in partnership with Southern Palmetto Regional Chamber (SPRC) and the Palmetto Innovation Center, targeting rural businesses/entrepreneurs to reverse the decline in local establishments (-9.3%).

Orangeburg County has a minority population of 66% and a DCI of 91.7, alongside a 23% poverty rate and 6.2% decline in employment from 2016-20; it is also the home of leading HBCU SCSU. Differentiated partnerships/programs: SC NEXUS will host an eiX spoke that leverages SCSU's technical capabilities (e.g., engineering programs) to provide practical, hands-on training to SCSU's students and faculty. EWC will also deploy support to local childcare entrepreneurs to expand access to childcare. In collaboration with H2RDT, SCSU will lead workforce development programming, including a new hydrogen concentration, internship opportunities for SCSU students, and a STEM summer camp for Orangeburg high school students.

In South Carolina's upstate, economic wellbeing in **Union County** has declined over the last 25 years (DCI 78.9 to 92.9, unemployment at 28%). Differentiated partnerships/programs: CIBI will create a battery certification program at Spartanburg Community College to facilitate local job entry. Lockhart Power, the investor-owned utility serving 6k county residents, will expand its 65-hour Operation Workforce Training program for recent high school graduates. The program, offering \$500 cash stipends to incentivize completion, will add new GRT programs including solar panel installation and line-worker safety coursework. The county will also host an eiX satellite spoke housed at USC Union, giving local residents access to Palmetto College [iCarolina Community Learning Labs](#).

J. Overview of outcomes and milestones expected from joint impact of the projects

SC NEXUS seeks to establish itself by 2034 as a premier hub for GRTs, on par with the region's leading automotive cluster. SC NEXUS aims to capture \$10B of the global GRT market with \$3-5B in annual GRT exports, catalyzing the growth of 28k+ skilled GRT workers, earning wages at least 40% above the average wage. The table below summarizes the joint impact of SC NEXUS projects across seven overarching goals. A detailed breakdown of goals, outcomes, and outputs are included in project narratives.

Goals	Outcomes	Outputs metrics (Base, 5-year goal, 10-year goal)	
Project Execution: Build and operationalize six projects on-time and within budget	Project construction/launch Project teams fully staffed Revenue streams developed	Projects completed Projects completed on-budget Projects financially self-sustainable	(0, 6, 6) (N/A,6,6) (0, 6, 6)
National Security: Enhance grid resilience by improving the cybersecurity of GRTs	GECO range operationalized GECO cyber defender training developed	# devices cyber tested Cyber vulnerabilities identified Cyber defenders trained	(0, 80, 230) (0, 170, 520) (0, 480, 1080)
Economic Security: Accelerate GRT commercialization to increase GRT industry competitiveness	Testbeds operationalized Firms recruited to utilize testbeds	# of devices tested # technologies advanced from TRL 6 to 9 # firms using testbeds	(4, 117, 516) (2, 27, 86) (0, 29, 99)
Ecosystem Investment: Develop a globally leading GRT ecosystem by attracting new industry investment	Firms attracted to SC NEXUS geography	\$ eiX capital deployed in SC NEXUS region # new jobs created in SC NEXUS region	(0,\$6M;\$15M) (0, 11K, 28K)
Workforce Development: Grow a world-class workforce for the GRT development and production	Various workforce programs launched	# students engaged # graduates of training programs % wage premium for GRT jobs vs. SC avg.	(0; 12.5K; 25K) (0, 3.1K, 7.5K) (40%;50%;50%)
Access to Capital: Increase capital formation/deployment to build leading innovation ecosystem	eiX accelerator launched	\$ eiX capital investment deployed \$ follow-on funding for capital recipients	(0; \$6M; \$15M) (0;\$175M;\$395M)
Equity and Diversity: Ensure equitable access to economic growth resulting from GRT industries	EWC and eiX programs deployed to underserved counties (Anchors) Firms attracted to Anchors	% trainees from Community Anchors % SC NEXUS capital investment deployed to Community Anchors	(N/A; 30%; 40%) (N/A; 40%; 40%)

SC NEXUS OVERARCHING NARRATIVE

K. Plan to accommodate growth in housing demand

SC NEXUS will ensure that the growth of GRT industries uplifts existing communities and protects long-time residents from housing displacement, with priority focus on Community Anchors. SC NEXUS will closely monitor the unique context of each community so that new industry investment is paired with appropriate housing support. SC NEXUS' plan recognizes that its geography bridges the rural-urban divide common across the U.S., with metropolitan areas like the Greenville-Spartanburg MSA experiencing rapid population growth (as much as 25% over the next decade) alongside rural Community Anchor counties like Allendale, Bamberg, Barnwell, and Union experiencing population declines and housing stock deterioration. Only six of SC NEXUS' 26 counties are projected to grow over the next decade. In Barnwell County, for example, [homeowner and rental vacancy rates](#) of 4% and 14%, respectively, significantly outpace the statewide averages of 1% and 9% with median home values of \$89,200 far below the statewide average of \$181,800.

Across the region, SC NEXUS will review housing metrics and contribute investment projections to the biannual [SC Housing Strategic Plan](#). The Principals Committee will consider housing displacement in its quarterly meeting. Where investment brings high risk of displacement, SC NEXUS will work with local governments to reduce regulatory burdens to accelerate the construction of new housing. In fact, South Carolina already [ranks fifth in the nation for new housing permitting](#), approving more single-family units (56 monthly per 100,000) residents than any other state. SC NEXUS will also leverage existing statewide initiatives like the [SC Housing Trust Fund](#) and [Palmetto Home Advantage](#) program and coordinate with promising local initiatives. Greenville County, for example, provides [tax incentives to developers](#) who build workforce housing units affordable to residents with 40- and 80% of the county's median household income. Through all its projects, especially the EWC, SC NEXUS will remove transportation, childcare, and other barriers to ensure that economic growth brings access to economic opportunity for all.

L. Overview of activities since Phase 1

Since Phase 1, SC NEXUS has evolved from a shared ambition for advanced energy leadership to a high-capacity organization coordinating the efforts of individuals across 52 organizations. SC NEXUS has engaged in a [far-reaching and rigorous process](#) to hone the broad technological focus of its Phase 1 application into a tightly-linked portfolio of GRT projects, soliciting and vetting 40+ project proposals. SC NEXUS has refocused its consortium membership to align with its narrower GRT focus, while actively recruiting new organizations to join the consortium (Duke Energy, Dominion Energy) and to lead and execute projects (Amentum, Bedrock Ventures, Applied Research Center). Moreover, SC NEXUS has engaged the communities it intends to benefit, including their leaders and the trusted community partners that provide critical links to grassroots organizations and residents (e.g., eiX's spokes at USC Union, SC State, and SPRC). Finally, SC NEXUS executed a comprehensive outreach strategy to build champions for its work, earning the support of officials who will continue to amplify SC NEXUS' potential. SC NEXUS' coalition-building has been recognized in [Governor Henry McMaster's 2024 State of the State Address](#), has won the support of General Assembly leadership (see commitment letters and [Joint Resolution 912](#)) for \$10M in recurring and \$40M in start-up appropriations, and has established a [brand](#) that is generating interest in GRTs from across the region.

M. Conclusion

SC NEXUS is organized and ready to execute its six proposed projects. Partner commitments demonstrate SC NEXUS has the resources available to become a globally leading GRT hub by 2034. Under the leadership of SC Commerce, which has a proven track record of mobilizing stakeholders and resources to achieve economic and community impacts, SC NEXUS is best-positioned to deliver U.S. leadership in the global GRT industry—and is eager to take on the challenge.