1. EXECUTIVE SUMMARY.

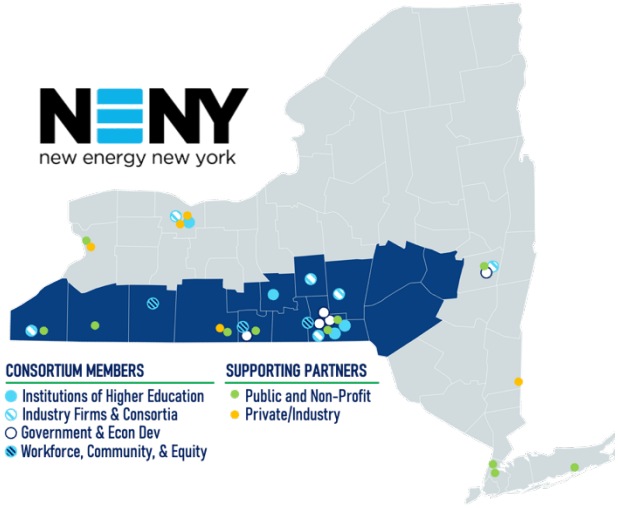
In 2022, Binghamton University secured $113M under EDA's Build Back Better Regional Challenge (BBBRC) for New Energy New York (NENY) to revitalize the Southern Tier of NY with a focus on battery industry opportunities. BBBRC projects, including a battery prototyping facility, supply chain expansion, and workforce development, laid the foundation of a regional technology cluster, which garnered recognition as a U.S. National Science Foundation Regional Innovation Engine and a federal Tech Hub Designee, boosting the cluster's momentum toward becoming a leading innovation ecosystem. The proposed Tech Hub projects will:

- Broaden NENY goals from regional economic development to promoting U.S. security, supply chain resiliency, and global competitiveness within the battery industry.
- Expand the focus to support industry growth across the entire battery supply chain.
- Extend private-public sector partnerships to launch new ecosystem- and equity-building projects to forge a comprehensive lab-to-market battery innovation ecosystem with regional and national impacts.

To realize its vision, the NENY Tech Hub has assembled a diverse private-public consortium supported by external mission-aligned organizations, including 20+ industry partners, secured >$20M in commitments, and created five interconnected projects addressing inclusive governance and community engagement, workforce development, technology maturation, manufacturing readiness, and supply chain resiliency.

2. SYNOPSIS.

2A. CONSORTIUM MEMBERS AND PARTNERS.



KEY: *Consortium members*, supporting partners.

Institutions Of Higher Education: *Binghamton University* (*lead;* NENY EDA BBBRC and NSF Engines awardee, home of Nobel Laureate inventor of Li-ion battery M. Stanley Whittingham, Battery-NY–1st in the nation industry-scale prototyping facility); *Cornell University* ($1.2B R&D expenditures; site of Cornell High Energy Synchrotron); *Rochester Institute of Technology* (3rd largest private STEM university in the U.S.; Battery Prototyping Center). These partners host ***5+ high-tech incubators.*** *SUNY Broome Community College (CC)* will coordinate with other CCs. ***Regional Government.*** *Broome County Executive's office* to work with other county governments. ***Industry Firms & Consortia.*** *New York Battery and Energy Storage Technology Consortium* (NY-BEST; >185 members organizations); *BAE Systems* (leading supplier of electric power and propulsion systems; planned expansion in the region); *C4V* and *iM3NY* (launched state's first gigafactory in the region); *Raymond Corporation* (subsidiary of Toyota Industries, producing electric lift trucks; planning regional expansion); *Electrovaya* (Canadian company opening gigafactory in the region); and 20+ additional industry partners. ***Economic Development Organizations:*** *Southern Tier 8* (to coordinate other Economic Development Districts); *The Agency* (Broome County Industrial Development Agency [IDA] to coordinate with IDAs across the region); *FuzeHub* (central Manufacturing Extension Partnership [MEP] to coordinate with regional MEPs AMT and Insyte)*; Three Rivers Development Corp* (economic development resources). ***Workforce Organizations:*** *Broome-Tioga Workforce* (coordinate with workforce boards); *Broome-Tioga Boards of Cooperative Education* (*BT BOCES;* coordinate with other BOCES). ***Community Non-Profits:*** *IncubatorWorks* (rural-serving incubator); *Community Foundation of Southern NY* (to engage community orgs). ***State:*** *Research Foundation for the State University of New York* (*RF SUNY*), *New York State Research & Development Authority (NYSERDA)*, Empire State Development (ESD).

Through a hub-and-spoke model, consortium members will work with their respective sectoral counterparts across the region to ensure coordination of efforts and to maximize the propagation of regional impacts.

NENY Tech Hub Consortium

Institutions Of Higher Education
Binghamton, Cornell, RIT, SUNY Broome CC

Regional Government
Broome County Executive

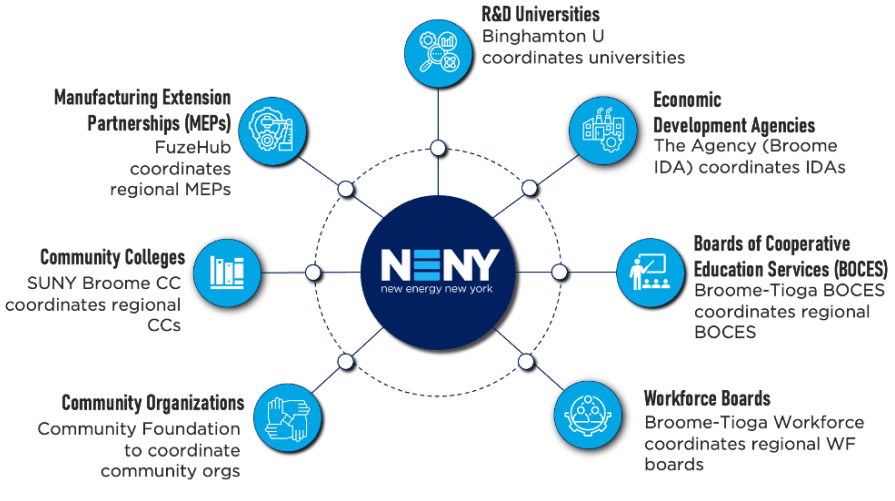
Industry Firms & Consortia
NY-BEST, Raymond, BAE, C4V/iM3NY, Elecrovaya

Economic Development Organizations
FuzeHub, Southern Tier 8, The Agency, Three Rivers Development Corporation

Workforce Organizations
Broome-Tioga Workforce

Community Non-Profits
IncubatorWorks, Community Foundation of Southern NY

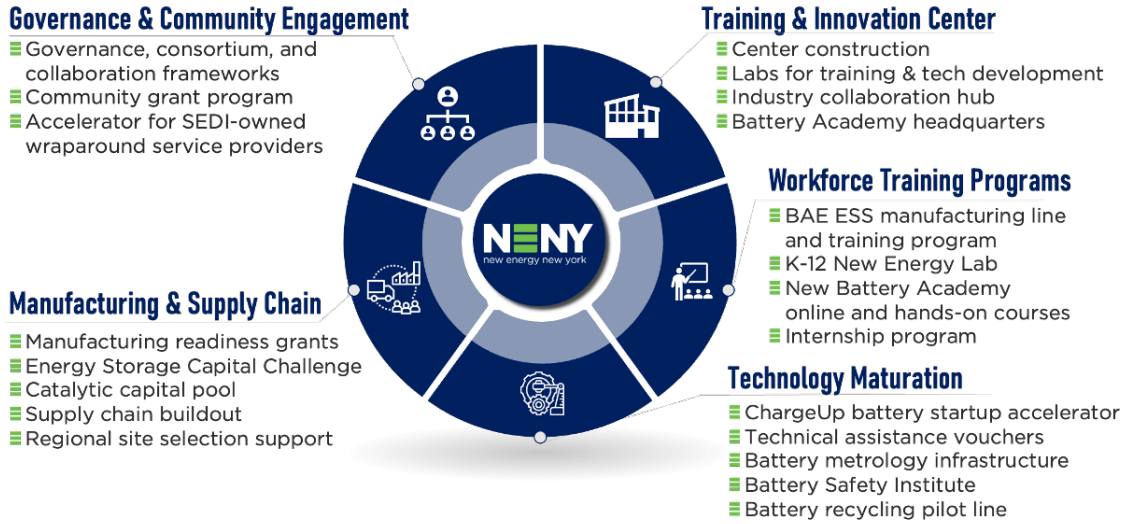
Statewide Organizations
RF SUNY, NYSERDA



2B. COMPONENT PROJECTS.

The NENY Tech Hub will implement five component projects to speed up the development and deployment of home-grown innovations, strengthen the domestic supply chain, and form an advanced manufacturing workforce based on equity, accessibility, and community engagement.

1. ***Governance & Community Engagement*** to provide the Hub's organizational frameworks and launch programs to support underserved individuals and organizations.
2. ***Workforce Development (WFD) Programs***, leveraging the NENY Battery Academy to grow a scalable and replicable model of WFD at all levels, with integrated strategies to broaden participation.
3. ***Training & Innovation Center*** to construct a state-of-the-art facility, alongside the Battery-NY Center, as a national destination for battery workforce development programs and technology innovators.
4. ***Technology Development & Maturation*** to accelerate technology translation by providing startup and technical assistance and expanding infrastructure capacity to build out a nation-leading battery testbed network, focusing on emerging industry gaps around safety and metrology.
5. ***Manufacturing & Supply Chain*** to support companies in expanding manufacturing readiness and capacity, build out regional and domestic supply chains, and assist with site selection.



2C. COMMITMENTS AND COMPLEMENTARY INVESTMENTS.

Hub consortium and partners are dedicated to maximizing regional, state, and national impacts, as evidenced by multiple direct ***commitments*** (>$20M) and ***complementary investments*** (~$50M) – see *Sections 5-6*.

2D. GLOBAL COMPETITIVENESS.

In contrast to other states setting up gigafactories to produce current battery technologies using established manufacturing methods that cannot keep up with the growing demand, NENY stands out by emphasizing the ***development and deployment of next-gen battery technologies***. NENY partners participate in federal initiatives such as the Li-Bridge Alliance and the Federal Consortium for Advanced Batteries (FCAB), tasked with identifying domestic industry gaps and growth strategies. Based on recommendations, including FCAB's *National Blueprint for Lithium Batteries*[1] and the *Li-Bridge Industry Report*[2], the Tech Hub will focus on:

- Creating a comprehensive, one-stop battery ecosystem addressing all industry needs across R&D and engineering, technology translation and scale-up, manufacturing, and workforce development.
- Growing a network of prototyping and testing infrastructure, circumventing the need for major capex investments by domestic innovators and preventing the loss of U.S. IP to foreign entities of concern.
- Developing a complete suite of industry-informed manufacturing and engineering training programs at all levels and across the battery supply chain, as a scalable model that can be replicated nationwide.

The Hub already has many pieces in place to accomplish these goals (see *4B*), including EDA BBBRC and NSF Engines, with proposed projects designed to fill the remaining gaps and amplify the regional momentum.

2E. CLIMATE AND ENVIRONMENTAL RESPONSIBILITY.

Battery technology is at the forefront of the fight against climate change, offering solutions to reduce emissions, enhance energy security, and transition to more sustainable and resilient energy systems. Yet, realizing these benefits requires addressing the environmental and social impacts associated with battery production and disposal, underscoring the need for a holistic approach that encompasses technological innovation, policy, and sustainable practices throughout the battery lifecycle. The NENY Tech Hub aims to spur battery innovations and build an advanced workforce to support climate mitigation and decarbonization goals, including by supporting the electrification of transportation, which produces a third of all emissions in the U.S. NENY will address the environmental challenges associated with the growth of the battery industry. The *Technology Development & Maturation* component, in concert with the NSF Engine's upstream R&D efforts, will support approaches to eliminate toxic chemicals in manufacturing, advance metrology methods to reduce waste and improve safety, develop recycling technologies to enable low-cost recovery of critical materials, and reduce reliance on unstable supply chains with ethical sourcing challenges. Tech Hub partners will also advocate for policy changes and investments that can accelerate advancements in this field.

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[1] https://www.energy.gov/eere/vehicles/articles/national-blueprint-lithium-batteries

[2] https://www.anl.gov/access/reference/libridge-industry-report

2F. EQUITY, EQUITABLE ECONOMIC GROWTH, AND INCLUSIVE INNOVATION ECONOMIES.

The Hub will infuse purposeful equity strategies across all component projects. *Governance & Community Engagement* will deliver a governance structure incorporating the voices of socially and economically disadvantaged individual (SEDI) populations across the region, while combatting institutional barriers that have disproportionately affected minority and low-income communities. *Workforce Development* initiatives will promote regional economic equity by developing an array of accessible training programs at all levels supported by wraparound services and a network of engaged grassroots partners, including technical schools, community colleges, workforce boards, and community organizations. *Technology Development & Maturation* will support SEDI inventors and founders, emphasizing inclusive recruitment, training, and mentoring, ensuring that diverse perspectives drive innovation, with high-tech ventures, manufacturing, and energy storage deployments (supported under *Manufacturing & Supply Chain*) benefiting SEDI communities.

2G. OUTCOMES.

The NENY Tech Hub will work synergistically with programs under the NENY NSF Engine, supporting battery technology innovation, manufacturing, and workforce development along the entire battery supply chain. The proposed activities will support >5000 trainees and garner >$2B in investments, generating >10,000 new battery supply chain jobs over 10 years invigorating U.S. leadership in battery innovation and manufacturing.

3. INDUSTRY CHALLENGES.

The NENY Tech Hub seeks to overcome key technological and industry-level obstacles highlighted by major federal reports, including FCAB's *National Blueprint for Lithium Batteries* and the *Li-Bridge Industry Report*.

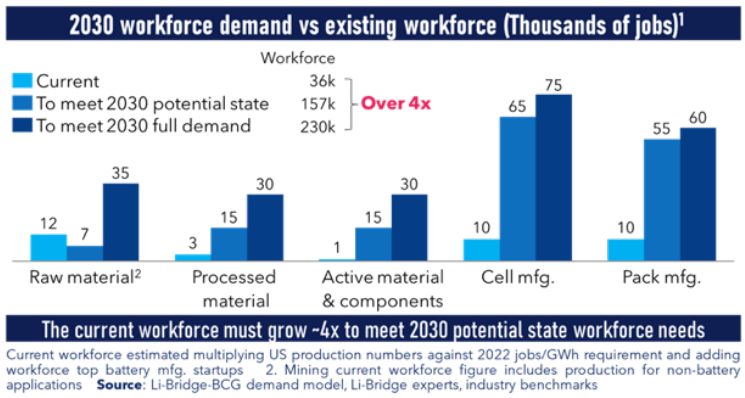
Supply Chain. The concentration of critical battery materials in a few countries, including foreign entities of concern, underscores the inherent risks of the domestic supply chain, with the Hub supporting diversification and buildout efforts under *Technology Development & Maturation* and *Manufacturing & Supply Chain.*

Technological Barriers. Current Li-ion batteries fall short of the energy density, safety, and operational reliability goals needed for long-range transportation and large-scale storage. Challenges related to manufacturing scalability, material compatibility, and longevity remain to be solved, including cost reductions to make transportation and renewable energy storage practical and cost-competitive without subsidies. Components focused on tech development and manufacturing readiness will work to address these hurdles by supporting the de-risking and piloting of technology innovations.

Recycling and End-of-Life Management. While <5% of Li-ion batteries are currently recycled through a complex and costly process, recycling is gaining recognition as a crucial source for addressing domestic supply chain challenges. *Technology Development & Maturation* will help advance innovations in this space, including by launching a pilot line to onshore a proven technology, while *WFD Programs* will engage recycling industry partners to co-develop training programs for the emerging needs in this space.

Infrastructure and Commercialization Speed. Limited access to key R&D, testing, and pilot manufacturing infrastructure is slowing the commercialization of home-grown innovations and risking the transfer of U.S. IP overseas. With overwhelming demand for a limited number of existing facilities across the country, there is a pressing need to expand available resources. With EDA BBBRC support, NENY is constructing Battery-NY, a first-in-class facility with unprecedented capacity (30MWh), offering industry-scale battery prototyping capabilities. Under the *Technology Development & Maturation* project, the Tech Hub will continue building infrastructure capacity to create a nation-leading battery testbed network.

Labor Force Needs. Demand for labor in the U.S. is projected to outstrip the current workforce across the entire supply chain, spanning R&D and engineering to manufacturing and recycling, but especially around midstream activities, requiring various sources of labor to be tapped. The *WFD Programs* will develop industry- and community-informed programs to train a battery workforce at all educational levels and across



the value chain, including hands-on technical training at a world-class *Training & Innovation Center*. NENY is generating a scalable comprehensive model of workforce development that can be replicated nationwide.

Safety. Safety is paramount in battery development, manufacturing, and deployment, especially with the industry's push for higher energy densities and faster charging. Achieving innovation while ensuring safety necessitates extensive testing, particularly for issues like thermal runaway. Addressing these concerns involves material science and metrology innovations, as well as robust standards and testing protocols, to be advanced under the *Technology Development & Maturation* project. Consortium member NY-BEST will also expand their Policy Leadership Circle (PLC) with a battery safety working group expected to engage >30 companies.

Metrology. Metrology is critical in advancing battery technology and ensuring battery products' quality, performance, and safety. Metrology innovations, to be supported by the *Technology Development & Maturation* component, are critical for new technology validation, material analysis, performance characterization, quality control, waste management, and standardization and certification.

Regulatory and Market Challenges. Diverse regulatory landscapes across jurisdictions can complicate the deployment of battery technologies. The *Governance* project will leverage key consortium members and partners as advocates for policy changes and safety standards, including the NY-BEST PLC battery safety working group expected to contribute >$300k annually to advance energy storage policy in NYS.

4. REGIONAL STRENGTH & DOMESTIC SECURITY.

4A. U.S. ECONOMIC AND NATIONAL SECURITY.

The U.S. produces 59 GWh of storage annually (8% of global output), while the domestic demand for EV batteries alone is forecast to reach 320 GWh in 2028. Lagging China and the E.U., the U.S. has only recently begun to prioritize the sector. We are dependent on unstable global supply chains and have lost many early-stage innovations to China, which is providing battery scale-up capabilities unavailable in the U.S., a challenge that the Battery-NY Center will address (being constructed under EDA BBBRC NENY award). China controls >75% of cell production, >70% of active material production, and >60% of material processing, capturing >90% of the value of every Li-ion battery sold in its market. The U.S. captures <30%.

The U.S. dependence on unstable global supply chains jeopardizes our economic and national security and climate goals. Innovation and increased production of battery technologies are essential for achieving greenhouse gas reduction goals and carbon neutrality by 2050. An underdeveloped domestic battery sector hinders the growth of downstream industries such as EVs, consumer electronics, medical devices, and renewable grid storage. U.S. national security is undercut if the military relies on foreign sources of advanced batteries, and foreign adversaries control upstream and midstream battery supply chains.

4B. REGION POTENTIAL FOR GLOBAL COMPETITIVENESS.

As a federally designated Battery Tech Hub, bolstered by the 2022 ***EDA BBBRC*** award ($63.7M EDA, $50M NYS ESD) and the 2024 ***NSF Engines award*** ($15M in first 2 years, and up to $160M over 10 years), the Southern Tier is uniquely poised to advance U.S. battery industry security and leadership. These pivotal

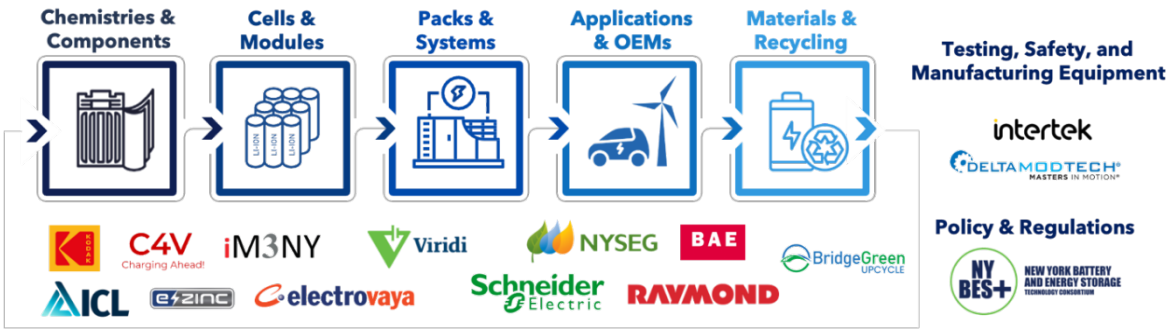
investments build upon a growing portfolio of regional assets and resources. NENY partner universities are undertaking cutting-edge R&D (***>$15M battery-related and >$1.4B total annual R&D expenditures***) and supporting sector-specific incubator programs (network of ***5+ high-tech incubators*** [>350 companies, >$1B raised, >1000 jobs created]), which have attracted a stream of startups establishing operations in the region (***>20 battery startups*** engaged by NENY in the past year). NENY is positioned to become the premier destination for battery innovators and startups, building out ***a comprehensive suite of programs*** to support the entire battery technology lab-to-market journey, from start-up to scale-up to market entry. The Tech Hub also offers a ***network of shared-use battery development infrastructure*** not available in any other region in the nation, including Binghamton's Northeast Center for Chemical Energy Storage Dry Room, RIT Battery Prototyping Center, NY-BEST BEST Test & Commercialization Center, Intertek Cortland Battery Lab, and the nation's first industry-scale prototyping center Battery-NY (under construction with EDA BBBRC support).

Under NENY, the Southern Tier has emerged as a ***battery sector workforce development leader***. With significant workforce needs, regional companies are partnering with NENY to develop training programs. NENY's strategy of coordinating diverse training organizations to deliver industry-responsive and inclusive training at multiple levels, including the ***NENY Battery Academy***, is increasingly recognized as a model approach. NENY is an ***invitee and awardee under two foundation initiatives*** to scale and replicate best practices in clean energy WFD (America Achieves Education to Employment and Ares Foundation JFF CREST Regional Workforce Challenge). NENY is also a ***member of the advisory taskforce for the Energy Academic Group at the Naval Postgraduate School***, sponsored through the Defense Production Act by the Office of the Undersecretary of Defense for Acquisition and Sustainment.

5. PRIVATE SECTOR PARTICIPATION.

NENY consortium partners boast a robust history of successful industry collaborations, including NY-BEST's ***>185 battery sector members***, RIT Battery Prototyping Center serving ***>50 companies***, and BBBRC NENY programs engaging ***>50 participating companies***, including ***>20 startups***. FuzeHub and regional MEPs connect with ***~1000 small- and medium-sized manufacturers (SMMs) in the region***. Many of these companies are actively investing and growing in the Southern Tier and nearby regions in NYS, including: ***iM3NY*** (>$250M investment) and ***Electrovaya*** (>$20M investment) to open battery gigafactories in the region; ***Raymond Corporation***, a subsidiary of Toyota Industries with a 100-yr history in the region, is growing Li-ion pack manufacturing for forklifts in the region with a new manufacturing facility opening in 2024; ***BAE Systems***, leading global supplier of electric power and propulsion systems, is significantly expanding their Energy Storage Solutions (ESS) facility for avionics and buses at BAE Systems Controls headquartered in Endicott, NY; ***Viridi***, a battery system manufacturer, is pioneering SEDI training programs and looking to expand capacity in Buffalo, NY; ***Bridge Green Upcycle***, a nascent venture, seeking to onshore de-risked battery recycling technologies and set up a pilot facility in the Southern Tier; ***Intertek***, a leading total quality assurance provider, opened a battery and energy storage testing laboratory in the region in 2023.

Tech Hub industry partners span the entire battery value chain, with their feedback ensuring timely



deployment of agile, industry-responsive programs. The labor force requirements of the industry partners inform NENY WFD program priority areas: *iM3NY*: 236 technicians – 3 years; *Raymond*: 50 manufacturing associates – 3 years; *C4V*: 50 engineers & technicians – 5 years; *Electrovaya:* 200 technicians & engineers – 5 years; *BAE Systems:* 50 engineers – 1 year; *Viridi*: 315 technicians & engineers – 3 years; *Li Industries*: 131 operators, technicians, & engineers – 4 years; *CMP*: 225 technician & office – 5 years. These companies are collaborating with NENY to co-develop training programs and hire regional talent. Additionally, our industry partners are leading cutting-edge R&D, defining the challenges to be addressed by the *Technology Development & Maturation* component, and will play a pivotal role in securing regional contracts and attracting suppliers and customers to the region, facilitated by the *Manufacturing & Supply Chain* project.

To advance the mission of the Tech Hub, specific industry commitments and support include:

- ***BAE Systems:*** $5M towards an ESS Product Line for prototyping and testing to enable aerospace electrification efforts, as well as for co-developing hands-on training programs with NENY.
- ***Phoenix Investors***: owners of Huron Campus, to support space needs of BAE ESS facility expansion.
- ***Raymond*** partnering on training for their pending advanced energy manufacturing expansion, as well as providing space for location of Bridge Green Upcycle's pilot battery recycling line.
- ***Bridge Green Upcycle:*** $3.8M towards pilot battery recycling line for R&D and training.
- ***Intertek:*** to host safety/certification workshops and collaborate on safety training development.
- ***Li Industries:*** to collaborate on training co-development related to battery recycling.
- ***C4V:*** executive team time to co-develop programs; access to pilot facility for R&D or training, including $20k/year access to advanced electrolyte system and LASER facility for large-format cell fabrication.

6. COMMITMENTS & INVESTMENTS.

PUBLIC SECTOR TECH HUB COMMITMENTS (~$15M)

- ***NYS Empire State Development (ESD)*:** $12M match to directly support Tech Hub projects.
- ***Binghamton University:*** $1M to support NENY Training & Innovation Center; new Occupational Health & Industrial Hygiene sequence on health and safety of battery manufacturing workers within a Master of Public Health (MPH) program.
- ***FuzeHub:*** $250k industry match from manufacturing readiness grant program; $150K commitment from Jeff Lawrence Fund for 3 battery startups; featured panel on Battery Energy and Storage trends in annual NYS Innovation Summit.
- ***Broome-Tioga BOCES*:** leasing space in the NENY Training & Innovation Center ($35k/year).
- ***Community Foundation of SCNY*:** $97k in-kind commitment and coordination with Community Foundation of Tompkins County and Community Foundation of Elmira-Corning and the Finger Lakes.
- ***NY-BEST:*** will expand the Policy Leadership Circle with a battery safety engaging >30 companies to contribute >$300k annually to advance energy storage policy in NYS.
- ***The Agency***: $0.5M in-kind match (personnel and strategic outreach materials) for coordinating the 14 county IDAs.
- ***Julius***: $175k in-kind contribution towards their AI and data-led workforce solutions for NENY utilization.
- ***Cornell***: $150k Ignite Lab-to-Market gap funding for maturing university battery and energy technologies.
- ***Southern Tier 8 EDD:*** $100k ARC LDD READY for strategy development around employment barriers.

COMPLEMENTARY PROJECT INVESTMENTS (~$50M)

- ***$15M NSF Engines award*** to NENY/Binghamton University over 2 years, with potential for $160M over 10 years, to advance battery sector R&D, technology translation, and workforce development.
- ***$16M ESD match*** for NENY Engine over 5 years.
- ***$2.2M ESD funding*** to expand the current footprint of the RIT Battery Prototyping Center.
- ***$10M Appalachian Regional Commission (ARC) ARISE award*** for *Manufacturing the New Energy Economy in Appalachia* to help SMMs access new opportunities in clean energy.
- ***$1.5M ARC Area Development Program award*** to supplement NENY programs.
- ***$4.5M NSF research award*** to test the pilot of a battery startup accelerator at Binghamton.
- ***$125k in foundation funding*** for NENY workforce development programs (American Achieves, CREST JFF).
- ***$5M C4V commitment*** towards NENY Investment fund for strategic equity investment into NENY startups.

POTENTIAL OR PENDING INVESTMENTS (>$20M)

- ***$50k SBA Growth Accelerator Fund Competition*** for NENY minority business network.

- ***$3M ESD Community and Regional Partner Program Fund*** to raise a NENY investment fund.
- ***$15M ESD/NYSTAR*** for the ChargeUp Battery Accelerator Investment Fund.
- ***$1M Families and Workers*** to supplement NENY workforce development programs.
- ***$750k Phase II CREST Jobs for the Future (JFF)*** to expand NENY Battery Academy programs.
- ***$1M Families & Workers*** to expand NENY WFD programs.
- ***$5M Bipartisan Infrastructure Law Battery Materials Processing & Battery Manufacturing*** led by 2 industry partners.
- ***UL Research Institute***: seeking expressions of interest for partners to build an electrochemical safety research facility.

7. REGIONAL ENGAGEMENT AND IMPACT.

7A. EQUITABLE & INCLUSIVE ECOSYSTEM.

The Hub region of service comprises 14 predominantly rural counties with ~1M residents and 38 federal Opportunity Zones in need of investment and economic resurgence. The region lags the country and the state with respect to income and poverty rates, with Broome County (home of Binghamton University) having the 3rd highest poverty rate in NYS. Barriers to participation drive the region's low educational attainment (25% without a high school diploma). NENY will address these socio-economic challenges through dedicated strategies to engage and empower SEDI populations to build a truly inclusive regional ecosystem.

Engagement. The *Governance & Community Engagement* project will establish a governance structure incorporating regional voices to bring benefits to SEDI communities across the Southern Tier. With representation from regional economic development and community organizations, NENY is lending considerable attention to the challenges faced by local residents, including those in Opportunity Zones and Climate Justice communities. The Tech Hub will design programs to benefit constituents as informed by the constituents themselves. NENY will leverage a DEIA Advisory Group to define strategies for asset-based community development and to build a strong network of agents, champions, and trusted community leaders. The consortium will draw on members such as the Community Foundation to serve as connectors and facilitators, with deep expertise and established trusted relationships with SEDI communities.

Empowerment. Our programs aim to build a diverse, inclusive, equitable, and accessible ecosystem that combats institutional barriers affecting minority and low-income communities. We will offer financial support and assistance programs to facilitate participation in the Tech Hub and its constituent projects. Our *WFD Programs* provide access to training at multiple levels through age-, skill-, and community-specific programs. The comprehensive, multiple-on-ramp approach involves technical training programs, community colleges, universities, workforce boards, and industry partners, providing wraparound services and stipends. Our *Technology Development & Maturation* team supports innovators from diverse backgrounds, focusing on companies with solutions positioned to impact disadvantaged communities. The *Manufacturing & Supply Chain* project promotes opportunities within the energy storage sector, making it easier for SEDI-owned businesses to compete. We support and connect Minority/Women-owned Business Enterprises (MWBE) and veteran-owned businesses through an accelerator for SEDI-owned service providers. These strategies will build trust and transparency with historically disadvantaged communities, enabling them to become active members of the Tech Hub and benefit from its emerging opportunities.

7B. LABOR UNION PARTICIPATION.

The NENY Tech Hub maintains strong partnerships with regional unions, with consortium members, including Broome-Tioga Workforce (BTWF) and Broome-Tioga BOCES, having a long history of collaboration with labor unions, including International Brotherhood of Electrical Workers (IBEW) and United Brotherhood of Carpenters and Joiners of America (UBC), as well as those in the plumbing, masonry, and sheet metal fields. BTWF maintains a strong union presence in its programs, partnering with unions and unionized companies to recruit workers. Broome-Tioga BOCES provides students with co-op and hands-on experience opportunities, and unions serve as advisors and speakers, while offering post-graduation hiring opportunities. Two organizations added to the Hub partner list are IBEW and the Workforce Development Institute (WDI).

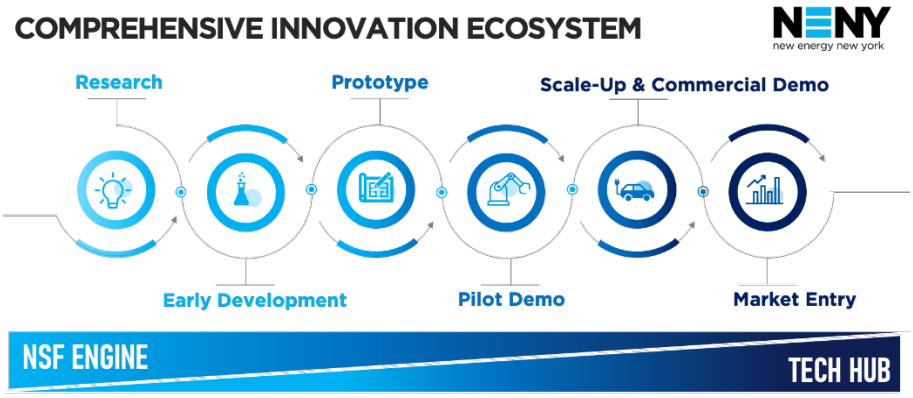
7C. HOUSING.

Despite the region's annual rental and median housing costs being lower than the national averages, NENY and regional leaders recognize the need for affordable housing solutions and are actively addressing growth opportunities through strategic planning and community collaborations. Working to prevent displacement, and promote new development, Hub partners are leveraging various opportunities, including ARC funding and HUD's Community Development Block Grant (CDBG) Programs. Eight Tech Hub counties are developing a new Strategic Plan around housing needs, with others also undertaking county-specific efforts:

- ***Broome*** (Binghamton MSA, ~25% of Tech Hub region population): established Housing Trust Fund to develop new affordable housing; since 2020, developed 980 new units, with 392 allocated as "affordable" for the growing workforce; Binghamton and Johnson City designated by NYS among the first 20 "pro-housing" communities, with prioritized access to $650M of state funding for residential development.
- ***Tioga:*** pursuing multi-family housing projects; participating in NY Main St grant for affordable housing.
- ***Cortland:*** planning housing study update; hosting CDBG for housing facility in Harford.
- ***Otsego:*** previous CDBG funding; prioritizing housing rehabilitation in small community centers.
- ***Southern Tier Central*** (***Chemung, Schuyler, and Steuben):*** completed rural and urban housing needs assessments (ARC and EDA CARES funding); two towns secured CDBG funding for rural housing.

8. EVOLVING VISION.

Following the Tech Hub Designation in 2023, we identified important considerations and implemented several strategic changes informed by partner engagement, as well as by regional and external developments.



Vision. During Phase I, the consortium expanded key partnerships, received >$30M for complementary NENY projects (including NSF Engines), and secured >$20M in commitments for Tech Hub projects (see *sections 5-6*). In concert with the Tech Hub Designation, the NSF Engine award crystallized an overarching vision of a complete lab-to-market battery industry ecosystem, in which Engine programs catalyze innovations that are subsequently matured and launched through the Tech Hub, supported by a suite of workforce, policy, financial, and infrastructure resources along each step of the tech development pathway.

Partnerships and coordination. During Phase I, we refined the hub-and-spoke model of coordinating efforts across the service region (see *2A*), working to create scalable models that can be propagated across the region and replicated nationwide. New members were added to the consortium: *BAE Systems* (planning a regional Energy Storage System expansion, with a proposed partnership around dual-purpose prototyping and training line); *NYSERDA* (statewide energy agency to enhance synergies with state priorities); *Broome Tioga BOCES* (to coordinate with BOCES across the region). The roster of supporting partners was also expanded: *Li-Industries* (collaborations around battery recycling WFD); *Intertek* (leader in safety and certifications, to provide workshops and co-develop safety training); *UL Research Institute* (to collaborate on safety initiatives); *Thermo Fisher Scientific* (increasing focus of their R&D instrumentation products to support battery metrology and forensics equipment). The Tech Hub designation and NSF Engine award have resulted in a flurry of interest from various private and public partners across the nation catalyzing new collaborations.

Future Projects. Our process for component project selection (RFI, stakeholder interviews, working sessions) identified concepts for major regional and industry priorities (e.g., pilot battery materials scale-up

facilities; system-level engineering training) that could not be developed within the timeframe. These concepts will be pursued as future projects and partnerships under the Tech Hub.

9. SUSTAINABILITY.

NYS has called for increased investment in battery technology to meet its ambitious renewables goals, including the unparalleled commitment of 6 GW of deployed energy storage by 2030. NENY will draw on state support, underscored by the commitment of two main economic development agencies, NYSERDA and ESD, to realize NENY's vision of positioning the state as a national leader in the battery and energy storage industry. As a burgeoning ecosystem marked by the proliferation of startups, expanding manufacturing, and the introduction of competitive products, the Tech Hub will move towards economic self-sufficiency.

The foundational NENY efforts have laid the groundwork for sustainable and scalable networks of regional Tech Hub collaborations. While many of the proposed frameworks and programs integrate with the regular operations of consortium and partner organizations, the Hub will pursue specific strategies to promote sustainability. NENY will leverage ***user fees from testing and prototyping facilities***, such as those being expanded under the *Technology Development & Maturation* component, as well as ***fees from industry training programs***, including those under the NENY Battery Academy. NENY partner universities, RF SUNY, and ESD all have investment funds, and NENY is working to establish a ***fund dedicated to battery and energy storage ventures*** under NSF Engines. By creating a robust startup ecosystem, NENY will attract additional investment funding that will generate a ***return from successful companies***. The Tech Hub will also establish business relationships with manufacturers and private investors with vested interests in the growth of the region. Success stories achieved under NENY will support ***fund-raising efforts of non-profit partners***, providing capital to maintain community-focused programs. NENY accomplishments around WFD programming have garnered increasing attention of ***philanthropic foundations***, including Ares Foundation and America Achieves, to be leveraged for future project development.

Tech Hub partners also have a ***strong track record in securing public-sector funding*** from sources including EDA, NSF, DOE, and SBA. Notably, the ***NENY NSF Engines award***, providing $15M over the next 2 years, will be able to support select Tech Hubs programs post-EDA-award if continued for the full $160M over the next decade. NENY will continue to stack such funding streams as they emerge. Driven by NENY's accomplishments, consortium members are ***increasingly sought after as partners and co-applicants for new opportunities***, such as the Bipartisan Infrastructure Law Grant Programs (NENY currently partnering on two industry proposals). The growth of the Hub positions its partners to take advantage of the recently announced $3.5B from the U.S. Department of Energy under the Infrastructure Law to boost domestic production of advanced batteries and battery materials.

10. OUTCOMES.

The NENY Tech Hub, with support from EDA, NSF, and NYS, will lead the American battery industry, promote energy and environmental goals, and enhance supply chain resiliency. The Hub will create a complete lab-to-market ecosystem that will innovate next-gen battery tech and manufacturing. Based on the baseline performance of NENY programs, current regional industry needs and planned expansions, and the roster of proposed programs, Tech Hub is expected to result in >5,000 trainees, >200 supported companies, >40 new training programs, >$2B in investments, and >10,000 new jobs within 10 years.

	Year 3	Year 5	Year 10
Trainees	1,000	2,000	5,000
Programs Launched	10	20	40
Companies Supported	50	100	200
Jobs Created	300	4,000	10,000
New Hub Partnerships	15	30	75