

Project Narrative for STEPs4GROWTH

Section 1: Project Description and Overview

Section 1a: Executive Summary

Project Title: STEPs4GROWTH [Successful Training and Effective Partnerships for Growing Regional Opportunities in the Workforce To Harness] the NC Clean Energy Alliance.

STEPS4GROWTH, led by NCA&T, will converge Clean Energy (CE) sectoral industries, sectoral champions/backbone organizations with NC education systems to establish a statewide CE workforce training and employment system for workers at all levels. System Development, Program Design, and Program Implementation phases will include: Industries; Backbone Organizations; Community College training partners; Workforce Development Boards; Regional Training Centers; Chambers of Commerce; Universities; High Schools; and other worker-support groups.

CE is one of the fastest growing economic sectors in the country and NC, a perennial leader in CE. Recent Congressional bills, executive orders from the Whitehouse, and the drive for resiliency/response to climate change are forces behind explosive CE economic growth. NC Governor Cooper's Executive Order 246, signed at NCA&T on 07Jan2022, is a state driver for CE expansion. EO246 updated goals for emissions reductions, resiliency, and electrification of the grid/transportation; and calls for investments in EVs, charging stations, environmental equity, energy efficiency, renewable energy, batteries and storage, and cybersecurity.

STEPS4GROWTH responds to this call for action with fast-track education and work-based solutions.

Four CE Sectors (Energy Efficiency, Renewable Energy, Clean Vehicles, and Grid & Storage) will be initially supported in four regions of the state (Charlotte, Greensboro, Halifax, and Northeast NC Coastal), with statewide expansion later. Underserved and economically challenged populations are a primary focus: 10 Tier-1 counties; and all counties served have African American populations 2-3.5 times the nations average.

STEPS4GROWTH will train-and-place 5000 credentialed/certified or degreed, skilled CE workers over 4 years in high-paying, high-growth good jobs.

Section 1b: Regional Workforce Training System and SLE

Notes: See attachment "Vocabulary for STEPs4GROWTH.pdf" for acronyms and definitions.

All superscripts^{Lxx} refer to page #s of specific commitment letters in the attached "Letters of Commitment for STEPs4GROWTH.pdf" *Credentialed/Certified participants* are those that have met the credit requirements for fast-track certificates (3-9 credits), short certificates (9-18 credits), pre-apprenticeship certificates (3 credits plus OJT hours), or apprenticeship certificates (15 credits, plus OJT hours). *Degreed participants* are those that have met the requirements for certificate degrees (30 credits), or AAS degrees (60 credits), or BS degrees (120 credits).

Credential/certificate-earning participants are in the process of getting credentialed/certified.

Degree-earning participants are in the process of getting degreed.

STEPS4GROWTH, led by Dr. Gokaraju^{L6-9}, will address demand for 3,000-10,000 new Clean Energy workers in NC each year using a CE sectoral partnership strategy Framework (Fig. 1).

NCA&T is the System Lead Entity (SLE)^{L30,170,10-14} for **STEPS4GROWTH**. The "Clean Energy Sectoral Partnership Strategy Framework for STEPs4GROWTH" is described here:

The CE sector will be experiencing significant growth for decades and **STEPS4GROWTH** is designed to support all CE developments. The NC Governor's office^{L1}, the NC Dept of Environmental Quality/State Energy Office^{L18}, the NC Dept of Commerce^{L16}, and many other stakeholders devoted to education and economic development across the state are key to this project. During the EO246 signing event, most of the fundamentals of **STEPS4GROWTH** were

Project Narrative for **STEPS4GROWTH**

spotlighted by Governor Cooper. This EO expanded prior orders/Bills in the CE economy: 80, 143, 218, 951. *The key takeaway: CE growth is happening, and NC must prepare a skilled workforce to support the economic development opportunities in the CE Sector.* No comprehensive CE Sector workforce system exists in NC, nor anywhere in the country, so this imperative not only helps NC, but will define the way to train hundreds of thousands of workers for the growing CE Sector across the US¹.

NCA&T/CERT: Clean-Energy System Lead Entity (PI: Dr. Gokaraju)

		Vertical Clean-Energy Sectors	Energy Efficiency	Renewable Energy	Clean Vehicles	Grid & Storage	
		Clean-Energy Sub-Sectors	Lighting, HVAC, Advanced Materials	Solar, Wind, Bio-Energy	EVs & (Charging Stations), Hydrogen & Fuel Cell	Batteries/ Storage, Smart Grid/Micro Grid/Grid Modernization, Cybersecurity of Grid	
		Backbone Leaders Thrust Leaders	Advanced Energy	NCSU Clean Tech Center	NCSEA & e4Carolinas	UNCC & e4Carolinas	
Horizontal Cross-Sector Leads & Thrusts	Precise Process Consulting	DEIA: Diversity, Equity, Inclusion and Accessibility					Students/ Employees & Employers
	Growth Sector	Wrap-around Services: Student Support Specialists					
	ApprenticeshipNC	Recruiting: Recruiting Participants					
	NC Business Committee for Education (NCBCE)	Job Placement: Matching Employers & Employees					
	Dr. Gokaraju, PI (NCAT/CERT)	Core Curriculum: Curriculum Development					Education & Training
	Dr. Teslero, co-PI (NCAT/CERT)	Hands-on Training: Training Center Development					
	Dr. Desai, co-PI (NCAT/CEPDAM)	Innovative Technology: Technology and Research					Technology & Research
	Dr. Russell, co-PI, AppState Univ/Appalachian Center)	Battery and Storage: Coordination across vertical CE Sectors					
	Dr. Monty, co-PI (NCAT/CERT)	Expansion: Scaling & Sustainability, Fund Raising					Growth
	Dr. Monty, co-PI (NCAT/CERT)	Advisory Boards: Internal and External					EAB & IAB

Figure 1. Clean Energy Sectoral Partnership Strategy Framework for STEPS4GROWTH.

STEPS4GROWTH will address Clean Energy through four Vertical CE Sectors and their sub-sectors (top of Fig. 1). These CE Sectors align with National/State jobs reports and DOE NREL.

This project is likely to be one of the larger EDA GJC proposals. The reason for its size is tied to the enormity of the overall CE Sector, and the very large vertical Sectors in Fig. 1. Each vertical CE Sector is quite distinct from the others, and their worker requirements are also unique, with some shared core learning across all vertical Sectors. Each Sector will need to develop unique sectoral partnership strategies to maximize their growth. **STEPS4GROWTH** leadership believes that the project is a combination of a Region A, C, and D activity (pgs 9-11 of the EDA GJC NOFO) which justifies the request for ~\$25M in funding over four years. Fig. 2 shows NC Regions, and Regional/mobile Training Centers.

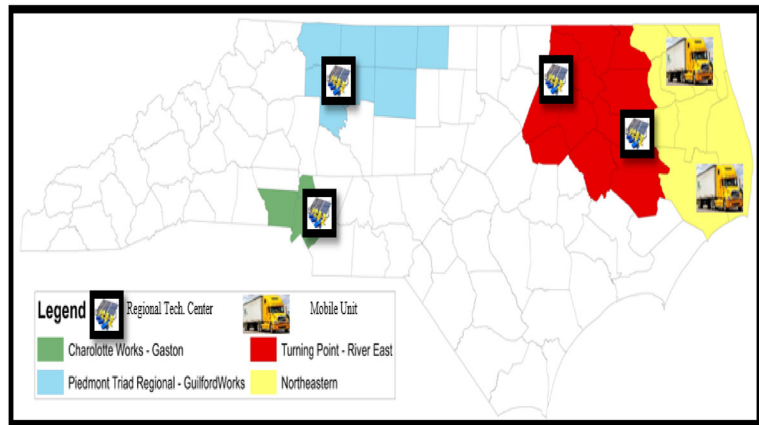


Figure 2: Distribution of Four Clean Energy Regions, Regional Training Centers and 2 Mobile Units in rural counties of NC.

Each CE Sector will have a “vertical sectoral partnership team” led by a **Backbone Organization** (Fig. 1); **technical training education partners** (Fig. 4) [CCs from all counties^{L142-147}; Regional Training Centers (RTCs) and Mobile units; Universities^{L158}; HSS^{L160-163} (CDC-Career Development Coordinators and CTE-Career Technical Education leadership); CE Regional Coordinators^{L155-156}; Regional SSSs; and existing Apprenticeship programs]; **and sectoral industry partners** (industry partners in each CE Sector^{L46-116}; NC Prosperity Zone regional leadership; WDBs^{L118-132} in each region; and CoC^{L134-140} from each county). Vertical teams will also collaborate with the 10 horizontal Thrust teams (Fig. 1 and Section 2b). Precise Process Consulting^{L149} (African American- and female-owned) will provide overall Program Management for STEPS4GROWTH. Collective Impact (CI)² methods will be used (*backbone organizations; common agendas; continuous communication; mutually reinforcing activities; and shared metrics*).

Each “vertical sectoral partnership team” will specify Pyramid Models (educational and work-based training models) for their Sector/sub-sectors (example, Fig 3). The Pyramid Models have on-ramps for participants at multiple levels (near-future workforce: HS, CC, university students; and early-career workforce: displaced, incumbent, undertrained, disadvantaged workers; veterans) to develop their knowledge and skills with stackable fast-track credentials/certificates from personal soft skills, through fundamentals in STEM, and through specific technical skills required in individual CE Sectors. Industry in each CE Sector will

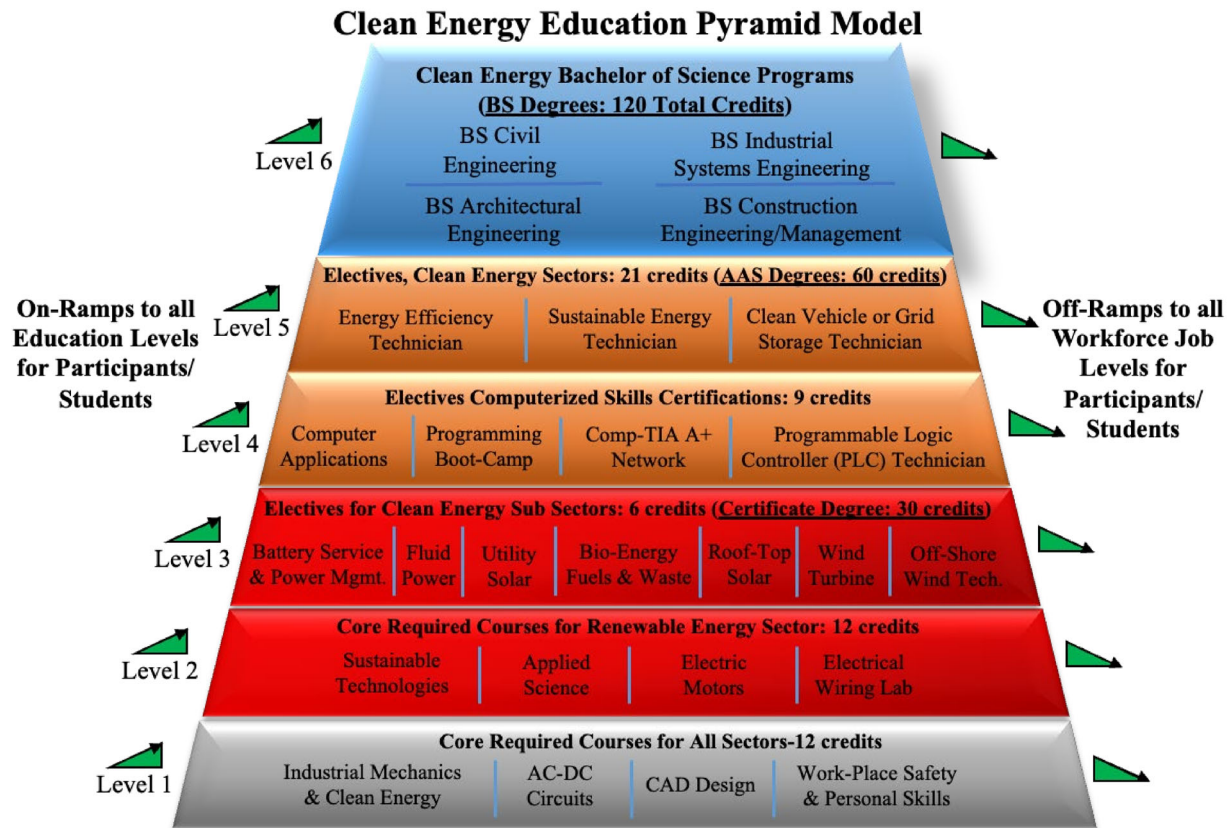


Figure 3. An example Clean Energy Education Pyramid Model for Renewable Energy. Pyramid Models provide off-ramps to the workforce at many levels: fast-track/short certificates; Associate of Applied

Sciences (AAS) degrees; Bachelor of Science (BS) degrees and beyond. *The Pyramid model flexibly supports virtually all CE workers.* A full description: “Pyramid Model Development for **STEPS4GROWTH**.pdf” is attached, including the process to identify “industry skills needed.”

There will be many *mutually reinforcing activities* (i.e. shared core curriculum and hands-on laboratory training) across the four vertical CE Sectors. Therefore, in the process of building Pyramid Models, specific attention will be given to ten horizontal cross-sector Thrusts (Fig. 1) that are critical to economic development and job creation: DEIA (diversity, equity, inclusion, and accessibility); Wrap-Around Services; Recruiting; Job Placement; Core Curriculum; Hands-on Training; Innovative Technology; Battery & Storage; Expansion; and Advisory Boards. These ten, horizontal cross-sector Thrusts will have Leaders/teams (Fig. 1) that will coordinate across the vertical CE Sectors to ensure success (reduce duplicative efforts; maximize investments; re-use assets; share knowledge and best-practices; and utilize CI methods).

System Lead Entity (SLE): NCA&T has been a leader in CE and Advanced Manufacturing for decades. NCA&T is a leading HBCU institute in the US (#1 ranking of public HBCUs, #1 producer of African American engineers at BS and Master’s level; and #1 producer of Black engineers that go on to earn a PhD). President Biden signed Executive Order 14041 in Sep2021 to support HBCU engagement, and NCA&T is working to become a Research 1 institute^{3,4}.

NCA&T/CERT/PI has demonstrated results in all the characteristics listed in the GJC NOFO (pgs 11-12) for SLEs (See NCA&T/CERT/Dr. Monty Letter of Commitment^{L10}). Most importantly, NCA&T is the sponsor of registered “energy-efficiency” and “solar” pre-apprenticeship & apprenticeship programs in NC (through ApprenticeshipNC) and has successfully implemented pilots in both Greensboro and Halifax. Thirty students completed pre-apprenticeship programs in summer 2021, and ~100 students will be trained in summer 2022 (non-EDA funded). Pre-apprenticeship programs (classroom & on-the-job training (OJT)) recruit students, introduce them to CE industries, and give both an opportunity to assess their interest in continuing credentialed/certified training. NCA&T’s 2021 Pilot resulted in ~20% of students receiving offers to continue to work with companies. **STEPS4GROWTH** will establish additional registered apprenticeships (EV battery, Grid cybersecurity, wind, etc.) that build upon the existing apprenticeship program called “NC Clean Energy-NCA&T Sponsor.” Students earn certificates for each course taken to off-ramp directly to the workforce at any level of education if desired, or they can continue with their education within the Pyramid Model.

The “**STEPS4GROWTH** apprenticeship model” gives both the company and apprentice time to determine interest levels in the jobs and to strengthen the relationship between employer and worker. Apprentices may continue their education while working part-time on AAS/BS degrees. Case-by-case decisions are made by each apprentice/employer to decide when to off-ramp to the workforce. This flexible fast-track, stacked-credential pyramid model allows for multi-level on- and off-ramps, providing solutions to workers (at all levels) and employers that meet the time and cost constraints for both. This model is particularly supportive for historically underserved populations (reported by ApprenticeshipNC)⁷⁰.

Section 2a: Employer Leadership and Commitments

Over 1000 CE companies in NC will be a driving force for economic development and jobs.

About 70 other individuals/organizations are joining the **STEPS4GROWTH** team.

STEPS4GROWTH will fill thousands of high-paying (and wage-increasing) jobs in each CE Sector. The project team has already collected 62 industry commitments^{L46-116}. With 700+ companies as members of **STEPS4GROWTH**’s Backbone organizations (CE leaders of knowledge, policy, and action in NC), off-ramping 2000-4000 credentialed or degreed workers

per year into the workforce is achievable. The process of attracting industry partners starts with the extensive Backbone membership lists from Advanced Energy^{L38}, NCSU Clean Energy Tech Center^{L166} NCSEA^{L40}, e4Carolinas^{L35}, and UNC Charlotte^{L41}. Jobs reports have identified ~1000 CE companies in NC. The youth apprenticeship program in Charlotte (Olympic HS^{L147}, a partner) has over 700 industry partners as well, and has been recognized as one of the top-3 youth-apprenticeship HSs in the country⁵. In addition to membership lists, companies have committed to expansion in the CE Sector in NC: **Toyota** is building a \$1.3B EV battery manufacturing plant in Greensboro (~1700 new CE jobs will be available by 2024-5 at the Toyota plant, with an estimate of another ~12,000 new jobs with Tier-1 and -2 suppliers to Toyota); **Boom Supersonic** is planning^{71,72} to build highly energy-efficient supersonic aircraft (lower-carbon footprint clean-vehicle technology on a per mile basis) for United Airlines at the Piedmont Triad International Airport in Greensboro; and major corporations like Apple and Google (need energy-efficient data-centers) are building facilities in NC. Additional growth is expected for Li-ion batteries using a lithium mine in NC, and DC-grid development is likely to grow rapidly with American Engineering Group in Charlotte^{L113}. Although **STEPs4GROWTH**'s focus is on CE, the training received (electrical, mechanical, mechatronics, computer graphics, computer science, etc.) will be attractive to CE-adjacent industries like aerospace, and high-tech. Adjacency will also apply geographically, with trained workers from NC being valuable to surrounding states and those across the US, and mobility of workers will be enabled through high-paying jobs.

Commitments to hire apprentices will be documented from most of our industry partners before the end of the System Development (SysDev) phase (Apr2023).

Section 2b: Other Stakeholders and Partnerships, Roles & Resp.

Backbone organizations will convene their CE Sectoral Partnership teams (from cross-sector Thrust members and organizations in Fig. 3) to define Pyramid Models that will prepare participants for jobs in their CE sectors.

Cross-sector Thrusts, their projects/leadership: (each Thrust is considered a major Project)

- DEIA: Led by Precise Process Consulting^{L149} (African American- and female-owned); with extensive DEI experience. Accessibility efforts will include Autistic professionals through the **Linking NC with Innovative Talent (LiNC-IT)** program.
- Wrap-Around Services: Growth Sector^{L165}; a leader in Student Support Specialist (SSS) models that focus on the social, educational, and financial needs of cohorts at ~40 CCs across the US (funded by large NSF & DOE grants). GS will organize, train, and manage 4 regional SSSs in the project. Jobs For the Future^{L151} (JFF) will work with GS to develop wrap-around services.
- Recruiting: ApprenticeshipNC^{L22} will provide guidance and assistance to recruit students for fast-track or short certifications, and apprenticeship programs for all age-group participants. Fig. 3 includes CE Regional Coordinators, CC career services, and HS CDC and CTE leadership that will recruit industries and students. Workforce boards and CoC will also support industry recruitment. A students-to-education-to-jobs tool called Navigator⁴⁶ will also be used to attract students and industry.
- Job Placement: NCBCCE^{L20} (NC Business Committee for Education) has extensive industry partnerships and brings educated students to the workforce through its “Navigator” tool (a first-of-its-kind solution bringing students-to-education-to-jobs). 19,000 NC educators have logged into Navigator. NCBCCE will be supported by NCWorks^{L128} (the statewide WDB lead), 8 of its 23 WDBs, and JFF.

- Core Curriculum: NCA&T; Dr. Gokaraju, PI^{L6-9}, has led and implemented \$23.2M fast-track and online hybrid OJT certification programs in Alabama for advanced manufacturing and mechatronics and has experience developing Pyramid Models for DOL and EDA. He also designed articulation agreements with universities, HS CTE programs, and CCs, with SACS accreditation. In NC, CAA (Comprehensive Articulation Agreement) oversees articulation.
- Hands-on Training: NCA&T; Dr. Tesiero^{L33} does extensive research in Energy Efficiency and has teaching labs on campus. He leads development of RTCs and Mobile unit training.
- Innovative Technology: NCA&T; Dr. Desai is the Director of CEPDAM^{L28} (Center of Excellence for Product Development and Advanced Manufacturing (AM)), with many industry members, and with CEPDAM state-of-the-art fabrication machinery.
STEPS4GROWTH will leverage the advanced cross-cutting research that can introduce innovative technology and solutions developed for the sectoral CE industry partnerships. The AM registered apprenticeship program in NC will be integrated to benefit training (courses and labs) in the CE Sector.
- Battery & Storage: Appalachian State University (ASU); Dr. Russell^{L172} is Director of the ASU Energy Center that leads the ASU State Energy Summit each summer & winter (~600 attendees). He will lead efforts on varied battery requirements across the 4 CE Sectors.
- Expansion: NCAT/CERT Director; Dr. Monty^{L10-14}: will lead the project to expand industry participation and to attract more funding. Dr. Monty works with DOE and NSF on energy research and education, and broadening participation research for underserved populations. CERT is a member of backbone organizations NCSEA, e4Carolinas, the NCSU State Energy Conference, and ASU's State Energy Summit, and collaborates with UNCC on grants.
- Advisory Boards: Dr. Monty has used Advisory Boards in grants and will convene both IABs and EABs, following ISO-9001 Management Review processes with both boards.

The CE Thrust teams (members from each CE Sector, with added experts (Fig. 3) that serve their cross-sector focus) will develop plans that work across the 4 vertical CE Sectors. LOC detail the specific roles and responsibilities each stakeholder has agreed to serve for **STEPS4GROWTH**, as well as why their organizations are ideal to perform those roles.

Work Plan (Fig. 5): Vertical and horizontal teams would meet biweekly to plan during the SysDev phase (Oct2022-Apr2023). Teams would define Pyramid models for their specific CE Sector/sub-sectors, and define curriculum, hands-on training, competency skills and OJT-experience desired by industry for high-quality jobs, and plan for Alpha testing. Detailed strategies would be worked out related to curriculum access (which CCs have the best curriculum and would share across the state), and what equipment is needed to train participants.

During the ProgDes phase (May2023-Apr2024), Alpha Test pre-apprenticeships/internships/OJT experience will be implemented in summer 2023 in each region, and equipment will be purchased to effectively train participants in one focused CE Sector per region (up to 25 students per region, or 100 total credential/certificate-earning summer participants).

Program Design (ProgDes) phase will refine and improve the certification/OJT/pre-apprenticeship offerings for Beta Testing in summer 2024. More equipment will be purchased and installed in each RTC and Mobile units to handle all CE Sector hands-on training, and an increased student population up to 60 students in each region in summer 2024 pre-apprenticeships (240 total credential/certificate-earning summer participants).

ProgImp phase is when the expansion and full implementation of **STEPs4GROWTH** takes place. After Beta Testing is done (summer 2024), each regional RTC will have all equipment needed to do hands-on training in all 4 CE Sectors. Also, access to RTCs will be complemented by two large 18-wheeler mobile units to cater to wide-spread rural CCs and schools. Building out the training capabilities in each region will allow participants to take multiple pathways into the workforce in any CE Sector or sub-sectors. Note that RTCs and mobile units will be used throughout the entire year. During the ProgImp phase, a full ramp-up of training occurs across all 4 regions of NC, and the count will increase to ~300 credentialed/certified summer participants in 2025, and then 500-1000 credentialed/certificated summer participants (in total, 2000-4000 credentials/certificates per year) in 2026, and beyond.

Region	Greensboro	Charlotte	Halifax	Northeast NC Coastal
Clean Energy Sector Primary Focus	Energy Efficiency	Grid & Storage	Clean Vehicles	Renewable Energy
Clean Energy Sector Secondary Focus	Clean Vehicles	Energy Efficiency	Grid & Storage	Renewable Energy
Counties	Guilford; Forsyth; Alamance; Randolph and Rockingham	Mecklenburg; Gaston	Halifax; Edgecombe; Northampton; Nash	Beaufort; Bertie; Martin; Pitt; Tyrrell; and Washington
Tier	2	3 (Mecklenburg); and 2 (Gaston)	1	1
Backbone Org	Advanced Energy	UNC Charlotte & e4Carolinas	NCSEA & e4Carolinas	NCSU Clean Tech Center
NC Prosperity Zone	Piedmont Triad	Southwest	Central; Northeast	Northeast
Workforce Development Boards (WDB)	Guilford Works; Piedmont Triad Regional Council; and Regional Partnership	Charlotte Works; and Gaston County	Turning Point; Rivers East	Rivers East; Northeastern
CCs	Guilford Tech; Forsyth Tech; Alamance; and Rockingham	Central Piedmont; and Gaston	Halifax; Edgecombe; Martin; Nash	Beaufort County; College of the Albemarle; and Pitt
Wrap-around Support	Regional Coordinators & SSSs	Regional Coordinators & SSSs	Regional Coordinators & SSSs	Regional Coordinators & SSSs
Regional Training Center location	at NCA&T (development site)	Olympic High School	Halifax CC	Martin CC
Economic Development Organizations (Chambers of Commerce, CoC)	Greesboro; Winston-Salem; Alamance County; and Western Rockingham CoC	Charlotte Area; and Gaston Business Association and CoC	Tarboro Edgecombe; Roanoke Valley; Martin County; Northampton County; Rocky Mount Area CoC	Washington-Beaufort County; Windsor/Bertie; Greenville; Tyrrell; and Washington County CoC
Existing Apprenticeship Programs	Energy Efficiency; Solar; Advanced Manufacturing, and Aircraft Maintenance			
High Schools	CDCs and CTE leaders	CDCs and CTE leaders	CDCs and CTE leaders	CDCs and CTE leaders

Figure 4. Clean Energy Sectoral Partnership Regional Stakeholders.

Section 3: Regional Location & Description, Skills needed, Population Served, Economic Development Strategy alignment

The Clean Energy Sector is rapidly growing and expected to grow faster in the future.

Federal investment in Clean Energy is accelerating through the Bipartisan Infrastructure Investment and Jobs Act (IIJA) (\$62B to attack climate change⁷). Additionally, the DOE announced, 13Jan2022, its “Clean Energy Corp” that will hire 1000 new employees⁷. CEDS (Comprehensive Economic Development Strategy) reports for the 4 **STEPs4GROWTH** regions^{6,8-11}; and recent NC comprehensive economic development strategies, plans and jobs reports^{12-19,74-79} were analyzed. Key targeted NC industry sectors include “clean energy, aerospace, and automotive manufacturing.” The NC State Energy Plan made a strong recommendation to build apprenticeship workforce programs for Clean Energy. In January 2022, the state reported 23,748 new jobs and \$10 billion in capital investment with the First in Talent workforce strategy^{4,12,51}.

With President Biden’s clean-energy vision: 50% carbon-emissions reduction by 2030 and carbon neutrality by 2050; and Governor Cooper’s EOs/Bills 80, 143, 218, 951, and 246 - the time to act is now. The CE work-based education model will also enable participants to be skill-ready for adjacent industries such as Aerospace and manufacturing.

Regional Location and Description: **STEPs4GROWTH** begins in 4 regions of NC (Fig 2). Key NC industries stand to benefit from **STEPs4GROWTH**’s worker production: Duke Energy,

Dominion Energy, Roanoke Electric Cooperative, Pike Electric, the Solar industry (#2 in US: installed solar), the Wind Energy industry, Toyota Battery mfg., Boom Supersonic, Google, Apple, EV and EV Charging industry, Lithium battery manufacturing and many others.

NC has a very strong education system, including 17 UNC System universities (with >4 HBCUs, and many HSIs), 58 CCs, and HSs across the state supported by the NC DPI.

The following segments highlight the jobs and growth in a few key NC CE Sectors.

CE jobs were 52% of ALL energy sector employment in NC in 2019 (energy-efficiency jobs being largest segment)^{24,47,55}. From 2007 to 2019, CE jobs grew 700%, unabated. CE job growth in NC was 5.2% from 2017 to 4Q2019⁴⁷, 40% faster than statewide employment growth. Moreover, CE jobs grew 16.6% from June2020 to Dec2020 (during pandemic), faster than the top-10 states except Michigan. Climate adaptation and resilience are rapidly emerging areas for CE jobs¹⁷.

CE workforce statistics include: for the US: >3.4M CE jobs²⁵; CE jobs outnumber fossil-fuel jobs in 42+ states; for NC: top-10 in total CE jobs in US ; a nuclear energy workforce of 10,256, 70 companies, producing \$10 billion annually in value⁷¹; a solar energy workforce of 3,400, 200 companies²⁵; a bio-energy workforce of 5500, 150 companies⁴⁷; 96 NC companies in smart grid⁷¹; the 2nd-largest cluster of energy storage companies (130) in the US producing the majority of the world's lithium battery components⁷⁰; and 5,800 Carolina dams with a total generating capacity of more than 9 gigawatts (30 hydroelectric companies, 500 workers)^{47,71}. Notably, the workforce is aging and must be replenished with skilled workers.

Clean Vehicle use will increase with deployment of EV charging stations. Governor Cooper's EO246 set a NC goal: \$1.25M EVs by 2030, and 100% EVs sold by 2050²¹. The IIJA²² will infuse \$109M for NC charging stations²¹. The VW settlement agreement²³ will inject ~\$73M (EVs and charging in 2022-24^{24, 50-54}). Policy changes make a difference. Global EV sales doubled in 2021 from 2020^{34-45,66-70}. The Greensboro region (Guilford and Randolph counties, wages \$49k/yr and \$38k/yr, respectively²⁷) has two new major Clean Vehicle investments: Toyota (1700 new direct good jobs, \$62k/yr, 1800 acres)²⁷ and Boom Supersonic Mfg (1750 new direct good jobs, \$82k/yr, 65 acres). New indirect jobs will number ~16,000⁺²⁹. Regional aviation manufacturing employment is expected to grow by 30% over the next 10 years⁷².

President Biden's Jan2021 executive order, with "Buy American" provisions, will convert 600,000 federal fleet vehicles to EVs³⁰ and deploy >500k charging stations nationwide and create ~1M new auto jobs; NC EV sales outpace the national market EV sales^{26,31-33}; and Duke Energy will invest \$25 million for EV pilots (public charging and electric school buses).

Off-shore wind (OSW) energy is fast-growing in NC, with the 2nd-highest OSW net-technical-energy potential in the US (off the Outer Banks). OSW expects to create a \$140B supply-chain and >25,000 good jobs by 2035. **STEPS4GROWTH** will develop needed workers for NC OSW starting as early as 2024^{43,79}. The NE NC Coastal region (21 Tier-1 and 4 Tier-2 counties) has added 297 manufacturing and utility-grid jobs in 5 years⁵¹. Avangrid Renewables completed a 104-turbine, 208-MW "Amazon" wind farm in the region in 2018⁴².

Regional job placement of 2000-4000 credentialed/certified or degreed skilled CE workers/year in high-paying jobs will occur by 2026. CE Manufacturing has a 1.68 location quotient (LQ) in Greensboro (68% more CE jobs than the national average), with wages of \$72,013⁵⁵. NC CE manufacturing will grow by 3%-10%/yr (~3k-10k new jobs/yr. across all CE sectors^{55,78}. NC is #1 in the US for rural clean-energy jobs (~29k workers, 27% of NC clean-

energy jobs⁷⁸. North Carolina is ranked ~9th in the US, with ~100k CE jobs. The CE economy employs 10 times more people than the fossil fuel economy²⁵.

NC CE manufacturing boasts the largest number of companies in the US making turbines, batteries, solar components, switches, carbon alloys, high-voltage cable, nuclear valves, filters, smart-grid components, lighting, building controls, power electronics, fuel-cell components, safety equipment, wind components, smart meters, and electric-vehicle components⁴⁹. The \$10B NC CE investment in 2021 supported the underserved (71% of projects: Tier 1 or 2 counties⁵⁰⁻⁵³).

NC's mfg. sector employs 452,000, 12.5 percent of NC's workforce⁵⁴, the largest mfg. workforce in southeastern US. Charlotte added 1,981 Jobs in 2021 in manufacturing (\$1.98B investment in 7 counties⁷¹). Manufacturing in the US is also trying to reduce cost through energy-efficient Lean Manufacturing concepts, and **STEPs4GROWTH** will elevate this goal with **CLean Mfg.** (Clean energy sector aligned with energy-efficient **Lean Mfg.**).

Skills Needed: NC House Bill 664 (signed into law 26Jun2019 by Governor Cooper) addresses State economic competitiveness: the State shall ensure that by the year 2030, 2 million 25-44-yr-olds (senior-, current-, and near-future workforce) will have completed a high-quality credential, certificate, or postsecondary degree. HB664 addresses a NC skills-gap problem: NC occupations that require a postsecondary credential or above are expected to outpace jobs needing only a HS degree by 2x between 2018 and 2028; 67% of NC jobs require post-secondary degrees; only 49% of NC residents aged 25-44 have postsecondary education; and 50% of employers need more hire-able workers. 75% of employers in NC jobs surveys were seeking to fill entry-level positions, but with high difficulty (60% of companies reporting). Lack of skills and overall education appears to be an issue. "Bill 664 sets an ambitious goal to get people needed education after high school" commented Governor Cooper. The dashboard.myfuturenc.org website reported NC was short 44,000 people for the intermediate 2019 goal of high-quality degrees or credentials; off-track to reach 2 million by 2030.

To qualify for the good jobs from the CE Sectors such as batteries, EVs, OSW, aerospace, and CE-adjacent sectors, technical skills emerge as the highest priorities for employers. From the E2 Clean Jobs NC 2019 report⁵⁵, 80% of CE employers reported difficulty hiring qualified workers. "To cultivate these kinds of (*good jobs*) industries, the (*rural NC*) region needs a better-educated workforce⁶⁸." This quote sums up the greatest challenge and need in rural NC: a well-trained (*and diverse*) workforce and talent pipeline.

Lower-level CTE skills and jobs offer the greatest numbers of good jobs. The Pyramid Model of "education and OJT" will emphasize technical- and soft-skills development at all levels from the certificate level through to 4-year degrees, supporting employees and employers alike.

Population Served: Ten counties in **STEPs4GROWTH** are rural and Tier 1 (with African American populations in the 45-50% range, 3.5x the nations average. The Greensboro region includes 4 Tier 2 counties. The median family income is ~\$43,300 in Halifax and NE NC Coastal Regions, ~\$62,700 in the Charlotte region, and ~\$50,600 in the Greensboro region. Based on a \$62,000 average wage in Toyota's battery mfg plant (Greensboro/Randolph), salaries in Tier 1 counties in the NE NC Coastal region might see a 43% increase in wages.

With higher numbers of African American students in all 4 regions of NC compared to the national averages, minority populations will be supported. During the CE pre-apprenticeship pilots in summer 2021, 93% of the students in Greensboro and Halifax were minorities and 64% were women. *Critical Mass Theory* of education was influential as a "shared cohort" of women in the Halifax solar program all graduated from the program.

One horizontal Thrust is focused on DEIA that will ensure underserved populations are supported (“A” for Accessibility). **STEPS4GROWTH** will work with career autistic professionals and with NCBCE’s LiNC-IT (Linking Inclusion for Innovative Talent, launched 2018) program that has a successful record developing a neurodiverse talent pipeline for NC employers⁵⁶. 97% of LiNC-IT graduates (60/62) have full-time wages surpassing NC’s average salary. The Autism Society of NC^{L24} and UNC TEACCH Autism Center^{L158} have provided job coaching/support for autistic professionals and employers for over 30 years (currently there are 89 individuals in LiNC-IT). **STEPS4GROWTH** will place up to 75 individuals in clean energy sector apprenticeships with LiNC-IT partners (i.e.: Apple and Google).

Economic Development Strategy Alignment: The jobs’ reports and economic development strategy/planning documents cited above contributed to the strategy in **STEPS4GROWTH**:

- Identifying, acquiring, and growing talent ensures NC competitiveness
- Collaborating with NC education and workforce development systems will better meet skills needs (with early OJT)
- Establishing the goal that NC will “Lead the Nation” in work-based learning (a Governor Cooper priority) that includes
 - Increasing collaboration between the Governor’s office, NCBCE, DOC Div. of Workforce Solutions, DPI, the CC System (58 CCs), the UNC System (17 Univ.), Independent Colleges/Universities, 23 WDBs, myFutureNC, and others.
 - Bringing new “good jobs” to NC (i.e. Toyota, Boom Supersonic, EV charging, OSW)
 - Implementing DEIA best-practices particularly in rural and underserved communities
 - Establishing “NC Job Ready Fund” (\$50k/workforce project), and WIOA funding
 - Increasing skills, fast-track certifications, OJT, educational attainment, stacked credentials, career exposure, apprenticeship wages, and wrap-around support
 - Connecting students/educators/employers (using software tools like NCBCE’s Navigator tool), and Sector-strategy models

All of these Strategies have been incorporated into STEPS4GROWTH’s plan. With 100k+ CE jobs in NC, and a 3% jobs growth rate, there will be at least 3,000 new NC CE job openings each year. Considering the influx of CE companies to NC, 3% is likely to grow to 10% soon. That would lead to 10,000 new NC CE job openings each year. In the US, with 3.4M jobs, a 3% growth rate implies about 100k new US CE job openings each year. These jobs would be available to skilled workers from **STEPS4GROWTH**.

Section 4: Impacts of the Regional Workforce Training System

Section 4a: SysDev, ProgDes, and ProgImp phases; and Regional Assets

STEPS4GROWTH will include a SysDev phase (7 mo), ProgDes phase (12 mo), and ProgImp phase (29 mo). The SysDev and ProgDes phases will establish a NEW Clean Energy workforce training system, and the ProgImp phase will establish a functional and sustainable system for the future. See the Work Plan Gantt chart (Fig. 5) for a *high-level view* of the goals/objectives and tasks (A more detailed Gantt chart is attached in Supporting Documents). The elements of a workforce training system exist in NC but there is presently no integration of these entities in the CE Sector. ***STEPS4GROWTH will solve this CE Sector problem by implementing a NEW sectoral partnership strategy to increase the CE regional workforce.***

SysDev will focus on planning with outputs that include: completing Pyramid Models for education/OJT in each CE Sector; identifying goals and deliverables across all teams; planning for wrap-around services; providing inclusion and accessibility for autistic professionals; defining job descriptions and competency-skills requirement in consultation with many

STEPs4GROWTH Project Narrative

industries for each CE sector; recruiting industry sponsors for employment and OJT experience; reaching out to HSs, CCs, WIOA centers, and universities to recruit participants; establishing 4 RTCs in 4 separate regions (plus 2 mobile 18-wheeler training units in geographically large eastern Carolina rural regions; a success story in PI’s work in Alabama); identifying curriculum for classroom and hands-on training; and preparing for an OJT experience/internship/pre-apprenticeship Alpha test in summer 2023. ProgDes expands upon the SysDev phase and will implement the Alpha test; increase the number of industry sponsors and participants; finalize the Pyramid Models for each CE Sector; enhance the RTC capacity and capability to train in all 4

Work Plan: STEP4GROWTH (High-Level Tasks, Deliverables and Milestones in support of Project Goals and Objectives)													
Note: more detailed Gantt Charts of Goals, Objectives, and Tasks will be generated by each CE Sectoral Partnership and Cross-Sector Thrust to augment this high-level Work Plan													
Goals/Objectives	Pre-award Summer 2022	2022		2023		2024		2025		2026			
		Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer			
Overall High-level Plan		System Development		Program Design, with some Alpha/Beta implementation		Program Implementation, Rollout in 4 Regions, Replication of all curriculum and hands-on training in all 4 Regions							
Goals for Vertical CE Sectors by Phase													
SysDev: Backbone Orgs establish CE sectoral partnership teams, meetings, reporting		Establish work team: Backbone Lead; WDBs; CCs; RTCs; CoC; SSSs & Wrap-around services; Industry partners											
SysDev: Produce a CE sectoral education/experience Pyramid model for each CE Sector (core and variations)		Define the curriculum that works for each CE Sector; and align with other CE sectors; Define hands-on training needs											
SysDev: Define the curriculum development and equipment needs for ProgDes phase		Define the course curriculum to be implemented at CCs and RTCs											
SysDev: Prepare for Alpha Testing in Summer 2023 in each Region			Plan for Alpha Test in each CE Sector										
SysDev: Alpha Testing				Run Alpha Testing (up to 100 students total)									
ProgDes: Detail the process of delivery of curriculum and experimental training for each CE Sector				Plan for each Region implementation with primary focus on one CE Sector; Improve on Alpha Tests; detail on-line and hands-on curriculum									
ProgDes: Purchase training equipment for each Region (for one of the four CE Sectors)					Outfit the RTC in each Region with hands-on equipment and associated curriculum for their CE Sector								
ProgDes: Prepare for Beta Test in Summer 2024 in each Region; do Beta Testing						Plan for Beta Test in each CE Sector	Run Beta Tests (1 CE Sector Curriculum in each region), up to 240 students total						
ProgImp: Prepare for implementation of full set of 4 CE Sector Pyramid Models in each Region							Plan to implement the full set of CE Sectoral Pyramid Models in each region. Determine who/what will be taught on-line, if additional equipment will be needed for course hands-on training. Collaborate with all horizontal cross-sector thrusts to ensure alignment, reduce costs.						
ProgImp: Ramp up for First cohort of students in each Region to take full spectrum of pre-apprenticeship training; Run Pilot #1; Plan and Run Pilot #2							Purchase equipment for 4 CE Sector training in RTCs, and for 2 mobile training units.	Run 4-CE-sector Pilot #1 in 4 regions (up to 300 students total)	Evaluate Pilot #1, improve, plan for Pilot #2	Run 4-CE-sector Pilot #2 in 4 regions (500-1000 students total)			

Figure 5. STEP4GROWTH Work Plan Gantt

CE Sectors; ensure that curriculum for classroom and hands-on training for all 4 CE Sectors is available in all 4 regions of NC; and prepare for OJT experience/internship/pre-apprenticeship Beta testing in summer 2024 that includes all 4 CE Sector Pyramid Models being taught in all 4 regions.

ProgImp phase will ramp up programs to 2000-4000 credentialed/certified or degreed skilled CE workers per year; fine-tune the Pyramid Models for each CE Sector; enhance the RTC/mobile capacity and capability to train much larger cohorts in all 4 CE Sectors; ensure that curriculum for classroom and hands-on training for all 4 CE Sectors is available in all 4 regions of NC (much of it online); and prepare for full ramp-up in late 2024 through 2026.

To reduce costs, streamline and standardize education across the state, much of the instruction curriculum will be online and self-paced, serving non-traditional participants. RTCs/mobile units will be scheduled to reach more participants in rural areas. CCs have agreed to work on a shared curriculum model to accelerate the rollout of CE education and to significantly reduce costs. The NC CE pre-apprenticeship and apprenticeship registered students will be given tuition waivers by the CC system, and credits will be transferred for 2-year degrees with articulation agreements in place. The vertical CE Sector partnership teams and horizontal cross-sector Thrust teams will coordinate the development and sharing of content and resources.

Section 4b: Addressing EDA Investment Priorities

STEPs4GROWTH supports EDA Recovery and Resilience priorities by building economic resilience to recover from economic shocks through: 1. training displaced energy workers from decommissioned coal and power-plant communities; 2. supporting CE Sector expansion that is more hurricane/storm resistant (solar, wind, battery storage, and electrified grid); 3. training workers across NC to relocate if needed for higher-paying CE jobs; and 4. providing worker flexibility for employment in technology-adjacent sectors such as aerospace, automobile manufacturing (especially in the EV market), or in advanced manufacturing businesses.

STEPs4GROWTH supports EDA's other investment priorities by creating a trained workforce for high-paying CE jobs (25% higher wages than the national average of wages)⁶⁹.

Other EDA investment priorities include 1. Equity (specifically addressed by the horizontal DEIA Thrust); 2. Workforce Development (2000-4000 credentialed/certified or degreed skilled CE workers/year will move through **STEPs4GROWTH** by 2025-26 and will acquire high-quality jobs in the CE Sector); 3. Manufacturing and service (CE Sector training will support manufacturing across NC including recently announced emerging technology jobs from Toyota, Boom Supersonic, EV charging, and other advanced manufacturing expansion); 4. Technology-based economic development (participants that learn CE skills will be able to work in adjacent technology jobs); 5. Environmentally-sustainable development (CE Sector jobs will fight the climate crisis through green products, processes, and buildings; **STEPs4GROWTH** is specifically targeting environmentally sustainable skills.); and 6. Exports and Foreign Direct Investment (FDI) (Toyota's battery manufacturing is funded by a Japanese company, and product will be exported globally for EVs. Boom Supersonic is a UK company whose supersonic aircraft will bring in FDI and will lead to exports from the US (\$2.9B invested).

Section 4c: Job Data Measurement and Impact, Leveraged Resources

STEPs4GROWTH expects between 2000-4000 jobs will be filled each year by the 4th year and beyond (note that 2000-4000 jobs is well below the 3k-10k estimated jobs that need to be filled each year in CE). These technical jobs will be accessible to all credentialed/certified and degreed skilled CE workers. Participants can build up work experience using stacked certifications to aim for high-growth and high-paying jobs requiring certificate degrees, or AAS degrees. Expectations for salaries are in the range of \$65k+/yr (~30-50% higher than average wages in the regions today. Since CE Sector jobs will be in-demand in NC and the US, there will be an acceleration in wage growth in the decades to come. Jobs in the CE Sector are not presently unionized in NC, but may move in that direction in certain sectors such as OSW, or EV charging station installation that require NEC certified electrician skills. **STEPs4GROWTH** will work with unions such as the IBEW (International Brotherhood of Electrical Workers) to align trained workers from **STEPs4GROWTH** with IBEW journeyman electrician jobs.

STEPs4GROWTH will measure *key metrics*, including breakouts by demographics: # of workers participating; # workers completing education and work-based training; # of workers placed in jobs); # of CE certificates earned; Average wages of job placements; Average wage growth of job placements (longitudinal participant tracking); Retention of workers placed (also included in longitudinal tracking); Amount spent on wrap-around services; and Total Average cost per worker in the program; and others.

STEPs4GROWTH has leveraged/will leverage numerous resources to augment EDA funds. NCA&T/CERT has already attracted resources of ~\$1.72M for CE pre-apprenticeshipi/appr. activities in the past 1.5 years. Funding and in-kind contributions identified to support **STEPs4GROWTH** during the EDA grant period, including stipends for participants during OJT

experience, are ~\$7.25M, not including other grant opportunities that the team will pursue. Details of resources mentioned above are included in the PI's Letter of Commitment^{L6-9}.

STEPS4GROWTH will collect data on salaries paid for apprenticeships and full-time jobs directly from the industry partners. Apprenticeship jobs will be posted in Navigator, and all salary information for jobs offered or filled will be gathered with the Navigator tool. A yearly report will give a summary of the job positions offered and filled. Additionally, the SSSs assigned to each of the 4 regions will have direct communication with the participants and will track their progress through **STEPS4GROWTH**. This will include gathering data related to their education, OJT, and job placements. The SSSs will additionally track the students after employment for a few years to understand student pathways using similar systems like Apprenticeship Registration and Tracking System (ARTS) adopted by the state of Washington. Yearly surveys of jobs by industry partners will be used to estimate workforce (job) needs of the industry, and to plan for accommodating that many students in the training pipeline.

Section 4d: STEPS4GROWTH Expected Results/Outcomes; Prior Successes

STEPS4GROWTH has an enormous opportunity to bring new, high-paying jobs to NC in the CE Sector. NCA&T has built very strong relationships in the CE Sector over the past decade, has built a strong reputation with results in research and educational projects, has attracted more than \$9M in funding in just the past ~5 years in the energy space, and expects to carry on its success story with **STEPS4GROWTH**.

Dr. Gokaraju, PI, was the lead of a \$2.2M DOL fast-track and hybrid certification program for advanced manufacturing, and provided consultation to a \$21M bond-funded project for CTEs in Alabama before coming to NCA&T. He has worked closely with CERT and the other stakeholders in NC to establish the first Energy Efficiency and Solar Apprenticeship programs in the state, and will build the first comprehensive credentialed/certified and degreed skilled CE worker program in the nation with **STEPS4GROWTH**. Dr. Monty has won many grants to develop underrepresented talent for STEM jobs in the energy sector. Dr. Monty's DOE grant is \$5M/5yrs, and focuses on bringing underserved students from CCs and 4-yr universities to the DOE National Labs. CERT and its affiliated faculty (Dr. Gokaraju, Dr. Tesiero, and Dr. Powell) have recently won \$3M in funding to help LMI households with Energy Efficiency upgrades to their homes (including solar installations), and to reduce negative health effects from asthma and lead-based paint. All the above projects involve tens of stakeholders and are examples of the team's ability to bring together groups to agree on common agendas, to keep communication lines open for all, to converge on shared metrics, and to coordinate activities that are mutually supporting and not duplicative. These are the fundamentals of CI theory, and CERT practices CI principles every day.

There is also tremendous support from the Governor's office, the legislature in NC, and many other governmental offices including the SEO and Dept of Commerce. As the team applying for this grant opportunity worked together for CE workforce development in the past year, there was a natural attraction to our concepts, preliminary work, and successes. Many companies, groups, and individuals reached out to our team to become part of this exciting opportunity. One example was Blue Ridge Solar that was thinking of building its own company-sponsored apprenticeship program, heard about **STEPS4GROWTH**, and therefore decided to collaborate with **STEPS4GROWTH** instead. This enthusiasm is expected to continue, and the program has an excellent chance of becoming a new standard process/practice in the state for economic development.

STEPS4GROWTH believes the metrics for success are achievable in the time frame of the EDA grant (4 years). With very strong support and ability to coordinate a large team of stakeholders, 2000-4000 credentialed/certified or degreed skilled CE workers per year will be trained for good jobs after the EDA funding period (>\$120M in new wages/yr). The demand for CE is growing rapidly, electrification of the grid and vehicle sectors is accelerating, and the need for more energy efficiency and more renewable energy from solar and wind will not abate in the next decades. All these factors will ensure attention to our project, will lead to sustainable and scalable efforts, and will be fully supported in years to come, even after EDA GJC funding ends.

Section 4e: Target Population, Recruitment, Regional Impact

The targeted participants in **STEPS4GROWTH** include: Ten Tier 1 counties, with African American (AA) population ~3.4x the nations average, and all other Tier 2 and 3 counties, with AA population ~2 times the nations average. Salaries across all 4 regions are underperforming, and due to new manufacturing factories like Toyota batteries in Greensboro, new jobs created will increase wages 30-50% over current average family incomes in the regions served.

The primary stakeholder groups directly impacted by **STEPS4GROWTH** include HS graduates, CCs and their students, 4-year universities and their students, and CE companies across NC that will be able to implement their economic growth plans. The stakeholders in **STEPS4GROWTH** leadership will be from ~70 organizations. The CE Sector in NC is comprised of about 1000 companies, with hundreds of other companies in CE-adjacent sectors that our students could be valuable to. A much larger indirect group of stakeholders will benefit from having 2000-4000 credentialed/certified or degreed skilled CE workers entering the CE workforce each year: the local economy surrounding all the industry partner locations that hire the skilled workforce, and the rest of the population in NC that will see an economic improvement for NC citizens.

The primary participants will be students either in HS, CC, or universities. To reach into HSs, we will utilize our CE Regional Coordinators to build relationships with the HS CDCs and CTE administrators. These individuals are the front-line access point to STEM teachers in the HSs, and therefore to students. Social media communication will be used extensively to attract students. The “most-followed” teachers, librarians, computer-lab instructors, administrators, or others within a HS will be used to reach the students through social media.

CC students will be reached through our CC partners that know their faculty and students through degree programs offered in their colleges. WDBs will source students that are displaced workers, incumbent, undertrained or need retraining, veterans, or others. Since online training will be available across NC from CE course instructors, opportunities will emerge for students in every county where they don't exist today. This is a unique feature of **STEPS4GROWTH**. By building the program new, technical CE education will be accessible across the state from CCs that have not offered CE education in the past. CE course instructors will be dispersed across the state, will be the best-of-the-best educators, and will be able to train remotely, cost-effectively, and at-scale; all in support of **STEPS4GROWTH**'s sectoral partnership strategy.

Section 5: Funding Request and Program Design & Implementation

Section 5a: Estimated Funding Request (SysDev, ProgDes, and ProgImp)

STEPS4GROWTH is a 4-region workforce training system for four CE Sectoral partnerships. The requested 4-year budget for **STEPS4GROWTH** is \$25,187,365. SysDev phase=\$3,290,001 (over 7 months). ProgDes phase=\$7,446,281 (over 12 months). ProgImp phase=\$14,451,483 (over 29 months). Details of the budget are attached along with a Budget Justification.

Section 5b: Description of SysDev, ProgDes, and ProgImp Phases

The 3 phases of **STEPS4GROWTH** were fully described above in [Section 1a](#), [Section 1b](#), [Section 2a](#), and [Section 2b](#). Summarizing, a 7-month SysDev planning phase will establish the curriculum (leveraging online and self-paced education whenever possible), and training needed in four CE sectors and will install equipment to do hands-on training. The 12-month ProgDes phase will run Alpha tests (summer 2023) in 4 CE sectors and 4 regions. At the end of the ProgDes phase, equipment will be in place to teach all 4 CE sector Pyramid Models in all 4 regions. The last 29-month ProgImp phase is the ramp-up of all training to be able to serve 2000-4000 credential/certificate-earning participants per year, and to place them into the workforce. A Beta test (summer 2024) of the training system begins at the beginning of ProgImp, and two additional Pilots (summers 2025, 2026) will optimize the training system for all 4 CE sectors.

Projects will be led by each Backbone organization (primarily to build Pyramid Models for their respective CE Sectoral Partnership Teams, and to run Alpha, Beta and Pilot programs); and by each cross-sector Thrust (Project) team. These projects are described in [Section 2b](#). “Pyramid Model Development” is described in detail as a separate attachment (same title).

Section 5c: Wrap-Around Support, Sustainability, and Participant Tracking

The risks for worker participation in this project are low (low probability, low impact). For those that have trouble accessing training, there will be funded wrap-around support and Student Support Specialists to aid participants. No mitigation plans are needed at this time.

Wrap around support is budgeted at \$1500/participant for half of expected participants. Additionally, SSSs in each region, and funds for Growth Sector and Jobs for the Future are significant and will allow for attention to be paid to needs and services. Transportation, childcare, coaching, and food will be considered, at a minimum. Cases will be handled on an individual level with the SSS in the region.

STEPS4GROWTH’s Framework was designed with *5 fundamental pillars for success*: [Equity](#), [Sustainability](#), [Cost-effectiveness](#), [Scalability](#), and [Worker-Needs-focus](#). The focus on many Tier-1 counties, and a horizontal DEIA Thrust will focus on [Equity](#). [Sustainability](#) is built-in through hundreds of industry partners that have real needs for workers, and the expectation of fund raising through additional grants (foundations, federal, state). There have been \$7.25M in likely funding already identified by the leadership team. Much of this funding is through the NCDEQ-SEO and funds from the DOE (strong supporters of NCA&Ts workforce development efforts in recent years). [Cost-effectiveness](#) is achieved through online education models, and shared RTCs. [Scalability](#) is also achieved through online approaches, and an organizational structure that is broad across NC. Reaching every corner of NC will be achievable in the future. [Worker needs](#) and employer needs are a key focus in this project, and the design of the Pyramid Models with very strong industry leadership will ensure worker and employer satisfaction.

Metrics were covered in [Section 4c](#), and will be collected by the SSS in the region, reviewed by IAB and EAB, with actions taken to drive toward our training and placement goals. Bi-annual summary reports from the IAB and EAB will report key metrics for **STEPS4GROWTH**. Job placement will be achieved through use of the Navigator tool, and other tools that align workers with employers (no matter the Level of training, nor the number of credentials/certificates earned). Students that continue in education will be tracked as are those that enter the workforce. Mechanisms will be established through additional funding to do longitudinal studies of the participants for as long as they are willing to provide their data to the program.