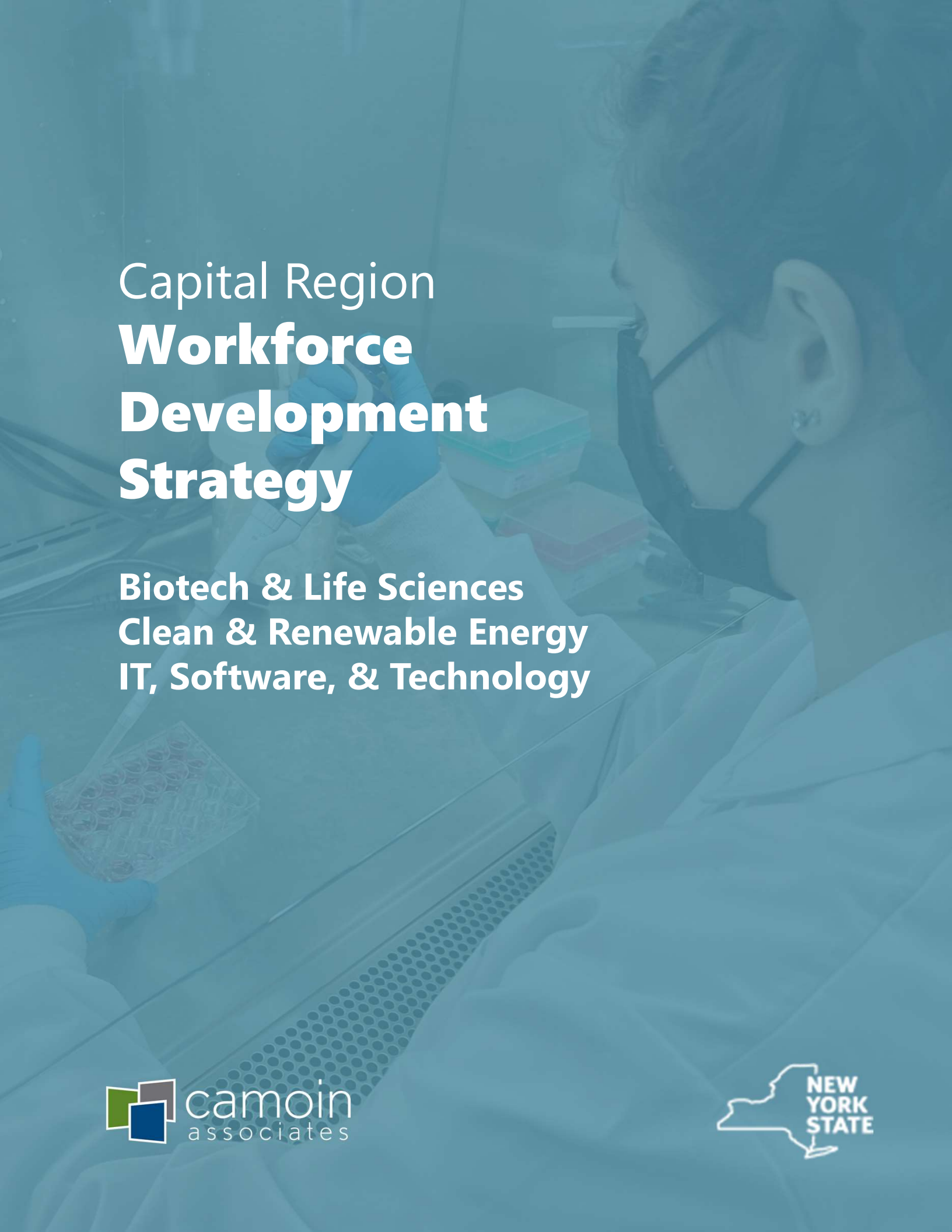

Capital Region

Workforce Development Strategy

Biotech & Life Sciences
Clean & Renewable Energy
IT, Software, & Technology

camoin associates

NEW YORK STATE

Preface

The Capital Region Regional Economic Development Council is pleased to submit the Capital Region Workforce Development Strategy, prepared in cooperation with our consultant team at Camoin Associates.

The strategy outlined in this document is a focused look at our targeted industry sectors of Biotech & Life Sciences, Clean & Renewable Energy, and IT, Software & Electronics.

These sectors align with one of the CREDC's core regional strategies: commercializing the region's innovative research and development ecosystem. We also know these sectors are globally competitive and that if we don't have the right mix of regional assets, industry leaders will look elsewhere. As a result, a diverse, available, able, and eager workforce is critical to our ability to attract, retain and grow these sectors and our regional economy generally.

Our research indicates that regional economic growth is dependent upon human capital and innovation, with a special focus on policies aimed at attracting and retaining educated workers and aligning economic development and workforce development systems to encourage up-skilling and the inclusion of populations left out of the traditional economy and labor force. This strategy and previous work by the CREDC prove these goals are not mutually exclusive.

We also learned that while this workforce strategy focuses on specific industry sectors, much of the data and recommendations are transferable to others. This will assist the CREDC's ongoing efforts to address workforce challenges in other key areas, such as the Healthcare, Manufacturing, and Tourism sectors.

The CREDC is actively working with our Healthcare industry to address rapidly evolving post-pandemic workforce challenges. The goal of those efforts is the same as this workforce strategy – to create a results-based plan to ensure a robust system is in place to cultivate the workforce that the industry requires to be successful. The challenges in this sector are real and urgent, but so are the opportunities. And the findings in this document are already assisting our parallel Healthcare efforts.

The CREDC remains focused on building a robust economic ecosystem for sustainable growth in the Capital Region and has seen unprecedented collaboration across all sectors to develop and implement its strategic roadmap for the eight-county region. We do this through partnerships, and this workforce strategy relies on deep collaborations with the regional educational community.

The Capital Region is home to 26 colleges and universities as well as numerous trade schools, apprenticeship and workforce education programs. The education sector within the Capital Region is a significant economic and cultural driver attracting tens-of-thousands of people per year from around the world. Our regional educational system is well-positioned to inspire, train and support New Yorkers throughout their careers, and the CREDC stands ready to move this strategy froward.

Ruth Mahoney
Executive Vice President &
President of Wealth Management
NBT Bank

Havidán Rodríguez, PhD
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Acknowledgements (cont.)

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Managing Organizations

The Capital Region Office of Empire State Development

The Center for Economic Growth

The photographs in this report were provided by ESD, REDC, and Workgroup members.

Contents

Introduction

Project Purpose

With businesses across New York State facing a substantial headwind as it relates to finding and retaining qualified workers, Empire State Development (ESD) initiated a project to help establish data-driven and stakeholder-informed workforce plans. Using input from job seeker and employer surveys, Department of Labor data, stakeholder interviews, and industry research, each Regional Economic Development Council was charged with developing sector-specific workforce development strategies to address the critical issues facing their priority industry clusters.

The work was completed throughout the late summer and early fall of 2022 and resulted in workforce development strategies that address regional issues as well as sector-specific challenges for the following sectors:

- **Biotech & Life Sciences**
- **Clean & Renewable Energy**
- **IT, Software, & Electronics**

The following document outlines the work completed as part of this effort as well as the findings and recommendations.

Engagement Activities

Between September 12 and October 25, the project team spoke with stakeholders that included businesses and service providers. Each session was staffed by an interviewer and a notetaker.

The project team identified potential interviewees, collected contact information from ESD, REDCs, and publicly available sources, and used a scheduling software platform to invite and set appointments. Interviewers used a preapproved script and list of questions during each interview, and notetakers used a standardized form to collect responses.

The overall objective of the engagement was to inform the development of actionable workforce development strategies through conversations with key stakeholders.

Data Analysis

The project team conducted a series of analyses to evaluate the current environment of the region and to estimate the workforce, training, and skills gaps within each tradable cluster. These analyses included:

Background Analysis: Provides background and context for the creation of targeted workforce development strategies for key tradable industry clusters within the region.

Industry Sector Definition: Includes all of the 6-digit NAICS industries within each cluster.

Staffing Pattern Analysis: Shows the unique occupational makeup of each industry, which allows us to evaluate the workforce needs of each cluster.

Workforce Gap Analysis: Estimates the gap between the projected supply of workers and the projected new job openings over the next 10 years to determine which occupations are likely to have the largest workforce shortages in the near future. The Top Gap Occupations are the primary focus of the workforce development strategies.

Training Gap Analysis: Identifies the training pipeline for the Top Occupations (i.e., those with the largest gaps). For each of the Top Occupation gaps, the training providers within the Region that offer programs related to that occupation (based on a SOC-to-CIP crosswalk) are shown. Not all of the Top Occupations require formal training beyond a high school diploma.

Skills Gap Analysis: Shows the most in-demand skills compared with the skills most held by workers within each cluster.

All data were sourced from Lightcast (formerly EMSI/Burning Glass) and are for 2021 unless otherwise noted.

1

Regional Background and Strategies

This chapter presents findings from the research and analysis that apply generally to the Capital Region economy, followed strategies and actions designed to address workforce challenges shared by the three tradable sectors.

What we heard

Businesses provided the following input about their workforce and training needs.

The comments below are general in nature and are relevant to all the tradable sectors.

By far the biggest challenge is finding people/building the pipeline, especially for technicians, entry-level, low- and middle-skill positions.

- Employers are willing to train people themselves and have increasingly turned to in-house and on-the-job training and mentoring for people with no degree or experience. The biggest issue they note is finding people with the aptitude, attitude, and eagerness who want to do the work, whether it is more traditional manufacturing or in a fast-growth/entrepreneurial environment.
- Employers feel that people in the labor pool lack awareness that there are growth opportunities and careers available within these companies, that people are "intimidated," or that people don't think they could perform a manufacturing or technical job without credentials or experience.
- There is a lack of highly skilled labor locally (for instance, chemical engineers, electrical engineers, and PhDs).
- Employers find that the region's competitiveness of recruiting and retaining talent is behind other areas of the country.
- There is fierce competition to offer increased wages, bigger sign-on bonuses, and more flexible working arrangements.
- Employers often cited internships as an effective strategy to build workforce because interns often come back to take full-time jobs.
- Employers would like to enhance their ability to engage with, and better access, talent and make students aware of opportunities.
- There is a need for life skills and coaching so people can learn about how to stop living paycheck to paycheck, how to invest in retirement, and other life skills.
- Opportunities for remote and flexible work depends completely on the kind of business and products being made: It is easier for software development but very difficult with manufacturing or lab work, where employees need to be on the floor. That translates to difficulty having split staff where some are remote, and others are not. In situations where technical staff need to be on the floor or in a lab, employers seem to prefer to have professional staff on site as well.
- Biggest need for wraparound services: childcare.
- Multiple employers have noted they use the Employer Resource Network for some of the support services/wraparound services.
- Government-funded programs for workforce development can be effective in terms of training quality, but not volume. Speed of delivery and bureaucracy is also an issue.
- For wraparound services and funds offered by the state, flexibility is key. The administrative effort and reporting requirements needed to provide gas cards, cab fare, vouchers, etc. is prohibitive. Would be more effective to just provide people with cash.
- Retention is a challenge in this low-unemployment environment, when people can jump to another job for more money—or if jobs are monotonous, have irregular shifts, or are physically demanding. Employers are finding that if they have jobs that are considered undesirable, they need to get creative with other offerings, such as growth and development opportunities, benefits, and flexibility.

What we discovered

Key data points from the background analysis for the Capital Region are summarized below and provided in-full in the Appendix.

This information provides context for the creation of targeted workforce strategies in the three tradable sectors.

DEMOGRAPHICS

Population
1.1 M

Diversity
19.6%
BIPOC Share of Population

Educational Attainment
36.9%
Bachelor's Degree +

Household Income
$56,681–$85,224
Range across region

ECONOMY

Jobs
540,347

Average Earnings
$80,899

Competitiveness
-34,984
jobs added or lost due to local factors

Gross Regional Product
$87.3 B

LABOR FORCE

Labor Force
559,234
June 2022

Underemployment
28.4%

Unemployment
2.9%
June 2022

Average Annual Completions
26,137
2016–2020

Regional Themes

The research and analysis coalesced around several themes that represent opportunities to close gaps in the workforce development pipeline.

These themes act as a common thread between the strategy elements. They cut across the three tradable sectors and are generally economy-wide.

Low participation rates.

There are over 345,000 missing workers in the labor force, which presents an opportunity to bring residents into (or back into) the workforce. Populations that offer the greatest impact in terms of expanding the workforce include older workers, individuals with disabilities, teens, females below the poverty line, and Black or African Americans workers.

Populations identified for workforce training in the 2021 Regional Workforce Inventory include magnet communities, disabled workers, teenaged labor force, justice-involved individuals, and disengaged adults.

Limited access to wraparound services.

Employers and employees are challenged by the inability to access services to make employment possible. Limited access to child and elder care, public transportation, housing, and other services is limiting the ability of residents to participate in the workforce.

Lack of awareness in the labor force about career pathways.

Employers noted that there seems to be a lack of awareness in the labor force of what opportunities exist within certain sectors. People tend to assume they need to come in with experience or certain skills and are often intimidated, where most employers are just looking for willing people whom they can train.

Competition startups vs. established businesses.

Within each of the tradable sectors, there are some new and emerging subsectors that are in startup or high-growth mode. These "Stage 2" businesses have similar labor force needs as more established businesses—specifically, electricians and software developers. This presents a challenge to companies who are more in the startup or high-growth stage, and therefore seen as "risky"; they must work harder to compete for workers from seemingly more stable companies.

Employability skills and life skills are lacking.

The engagement and data research both found that the labor force is lacking basic employability skills that serve as a foundation on which to layer more specialized training. Several employers also mentioned that the labor pool lacks "life skills" such as financial management.

Implementation Plan Overview: Regional Strategies

The implementation plan contains a series of projects and initiatives to advance the goals of the Capital Region's Workforce Development Strategy across the three tradable sectors.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Strategy	Description	Partners
1.A	Network the workforce development system	Strategies to help employers navigate the workforce development system more efficiently, including digital solutions as well as increasing capacity.	Center for Economic Growth, ESD, DOL, K-12 and Higher Education Institutions
1.B	Proactively address barriers to entry	Taking actions to proactively address challenges that inhibit people from entering the labor force, or being underemployed, can increase participation and retention rates of underrepresented populations.	Brightside Up, regional economic developers, Community Loan Fund, training providers, employers
1.C	Increase participation of under-supported individuals	Strategies to accommodate the unique needs of women, black, indigenous, and people of color (BIPOC), the disabled, and other underserved and underrepresented individuals to create more welcoming work environments and increase the labor force in the Capital Region.	New York State Disability Services Council (NYSDSC), Anderson Center for Autism, Center for Disability Services, Employers, DOL, Capital District WERC, NYSID

Strategies employers are currently using to attract and retain workers:

- Internships and apprenticeships are among the best ways to recruit and keep employees
- Recruiters
- LinkedIn, Indeed, Social Media
- Providing opportunities for growth within the company (a career path)
- Offering creative benefits
- Full-time staff dedicated to in-house training
- Capital Region Employer Resource Network
- Outreach to partners (naval bases, veteran organizations, Capital Region WFD Board, HVCC, SCCC, BOCES, universities, Chamber of Commerce)
- Engagement with colleges and universities
- Programs to engage with K-12 and get kids interested in STEM
- Recruit from outside the area (mainly for employees with PhD's and masters)
- Creating the ability for new people to rotate among departments for experience

Network the workforce development system

STRATEGY 1.A

Creating a regional ecosystem that is connected and easily navigable will help area employers more efficiently access and utilize workforce development programs and resources.

The Capital Region has an abundance of workforce development organizations that are providing critical services; however, from the perspective of employers trying to tap into these resources, they find the system disjointed and sometimes decide that it is easier (i.e., faster) to handle recruiting and training internally.

ACTION 1

Build a connected network for all agencies and funding streams

Digital one-stop. Create a one-stop digital portal where Capital Region employers can go to access materials and information about programs and funding available to them across the region. The hub must be maintained to provide real-time information.

Example: Tallo

ACTION 2

Assign one entity to become the region's workforce system 'hub'

Quality & Consistency. Coherence and consistency of information and resources coming from the various workforce development organizations is critical to improve navigation of the system for employers.

Track & Report. This entity should also track data on supply and demand, and work within the regional system to adapt quickly to the changing needs of individual sectors. Create a detailed project plan for tracking and reporting data across the system.

Possible Partner: Center for Economic Growth (CEG)

ACTION 3

Offer workforce development navigators

Workforce Development Navigator. Take a case-management approach to connecting employers into the workforce development system, alleviating employers from having to navigate the system themselves. Each employer would have one person who is their go-to person, who serves as a concierge to the workforce development system.

The Navigators would be responsible for conducting an initial assessment of business needs, connecting businesses to existing programs that will fill their needs and/or bringing together appropriate stakeholders to create new programs to support businesses. This is a highly skilled position, which understands both the private sector and workforce system.

Track & Report. Navigators should also track metrics on businesses assisted, outputs, and outcomes.

Marketing & Promotion. Navigators can also be responsible for some of the marketing and promotion tasks included in this strategy.

Inventory Current State. Conduct an inventory of the current system to understand where elements of Navigator services exist and where there are gaps to fill.

Who is doing it well: The Business Resource Network, Canton, OH

Proactively address barriers to entry

STRATEGY 1.B

Proactively addressing challenges that inhibit people from entering the labor force, or being underemployed, can increase participation and retention rates of underrepresented populations that face increased barriers to entry and advancement.

ACTION 1

Support businesses to explore childcare models

Utilize BRE visits. Connect businesses with resources through business retention and expansion (BRE) visits. Equip the region's economic developers who conduct BRE visits with information about where businesses can go to find childcare solutions for their employees.

Ensure employers are aware of the Excelsior Child Care Services Tax Credit, as applicable.

Facilitate collaboration. While large employers can sometimes have the critical mass to create childcare onsite, small and midsized businesses are typically less able to provide solutions themselves. Support economic developers in facilitating collaboration of neighboring small and midsize businesses to address childcare collectively.

Potential partners: Brightside Up, Community Loan Fund of the Capital Region, economic developers

ACTION 2

Offer success coaches

Provide more career and life skill coaches at worksites. These coaches will help employees plug into the individual services that are available to them (e.g., transportation, childcare, substance abuse counseling, financial literacy, supplies and uniform distribution, professional skills development).

Potential Partners: Capital Region Employer Resource Network (Expand capacity to provide services.)

ACTION 3

Improve employability skills

Standardize curriculum. Work with training providers (k-12 and higher-ed) to develop employability skill classes and ensure these classes are part of the standard curriculum. Additionally, work to ensure life skills are incorporated into standard curriculum to improve job-readiness of students.

Math skills. Continue to prioritize math skills in youth and adult training. Work closely with K-12 educators and higher education on this issue.

Ongoing discussions. Checking in with employers annually to discuss what strengths new trainees have and what skills they are lacking can help schools (k-12 and higher-ed) and training providers refine their curriculum in response to employers' needs.

Potential partners: High Schools, BOCES of the Capital Region, Washington-Saratoga-Warren-Hamilton-Essex BOCES, NYS Department of Education

ACTION 4

Create employer-based training programs to highlight business culture and values

Set expectations. Create orientation at the beginning of employment that highlights the corporate values and expectations. Also highlight model behavior from existing employees. Create mentorship and peer-to-peer programs.

Of Note: The Capital Region Employer Resource Network's success coaches serve as a direct conduit to community resources and services that provide fast relief for many challenges that employees face from transportation to housing.

Increase participation of under-supported individuals

STRATEGY 1.C

Working to understand and accommodate the unique needs of women, BIPOC, disabled individuals, and other underserved and underrepresented groups can create more welcoming work environments and expand the labor force.

ACTION 1

Accommodate employees with special needs

Flexible work hours. Individuals with mobility issues who rely on specialized transportation often struggle to meet the expectations of regular work hours as their transportation is sometimes less reliable. Employers who can be flexible with work schedules will have greater success retaining employees that require specialized transportation.

Success coaching. Provide onsite success coaches for individuals with neurodivergent needs who can help with 1:1 training of the employee. Success coaches also coach managers on how to best work with the employee.

Partner Organizations: New York State Disability Services Council (NYSDSC), Anderson Center for Autism, Center for Disability Services, NYSID, Colleges & Universities

ACTION 2

Increase cultural competency of employers

Address misconceptions. Develop communication information (hard copy materials and/or video content) to share with employers that break down misconceptions about certain populations, such as refugees, to make it easier for employers to connect with different populations and become more welcoming of various communities into their workforce.

ACTION 3

Prepare women and BIPOC for senior management roles

Fix the "Broken Rung". Women and BIPOC are underrepresented in leadership and management roles in the region. Work with area employers to help underrepresented employees take the first step in management. Create regional management training programs for underrepresented employees within the tradable sectors. Who is doing it well: Women's Impact Alliance and SOAR.

Build networks. Design events and programming for female and BIPOC employees on the management track to build and grow their professional networks of peers and mentors with others taking or who have taken similar career paths in the region.

Potential Partner: Capital District WERC

ACTION 4

Address unconscious bias for all managers

Challenge bias. Create more inclusive workplaces and mitigate biases that women and communities of color are up against by making managers more aware. Create a training program on unconscious bias that managers can take annually to become aware of, and refreshed on, what unconscious bias looks like and how to make positive changes to address it.

Encourage employers to track and report out on outcomes for promotions and raises by gender and race/ethnicity as well as layoffs and furloughs. This program can be made available to all managers across sectors as capacity exists.

2

Biotech & Life Sciences

Background on Biotech & Life Sciences

Purpose

This workforce strategy for Biotech & Life Sciences builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of Biotech & Life Sciences businesses in the Capital Region.

Sector Definition

The Biotech & Life Sciences sector includes biotech, life sciences, and pharmaceutical companies focusing on both research and development as well as manufacturing, including medical equipment, instruments, and testing laboratories.

Companies Engaged

Companies interviewed for this work include:

- Regeneron Pharmaceuticals
- Curia
- Praxis Powder Technology

Why Biotech & Life Sciences?

The Biotech & Life Sciences sector is a critical element of the Capital Region's economy.

Significant Employment

14,255

jobs, 3% of the region's employment

Notable Businesses

196

establishments, 0.7% share of region's total

High Growth

2,566

jobs added 2017–2021, 22% growth

Specialization

7.27

average LQ*, highest subsector LQ of 22.4 *(7.27x more concentrated than U.S.)*

* Location Quotient (LQ) measures the region's industrial specialization relative to the U.S.

Industry Assets

Biotech & Life Sciences firms in the Capital Region benefit from a talent development pipeline that includes SUNY Polytechnic Institute, the University at Albany, Albany College of Pharmacy and Health Sciences, College of Biomedical Equipment Technology (CBET), and Rensselaer Polytechnic Institute (RPI).

The National Institutes of Health (NIH) on average annually awards more than $50 million to Capital Region biopharma and life sciences companies and R&D centers.

Of Note:
The Albany College of Pharmacy's Center for Biopharmaceutical Education and Training is undergoing a significant expansion. This project is a multipronged effort to advance Life Sciences research and build the Life Sciences workforce, making it the only research and training center of its kind to be founded at a pharmacy school, which will undoubtably support talent attraction and retention in the Capital Region's Biotech & Life Sciences sector.

"Companies in this sector are desperate for entry-level workers, not just PhDs."

What we heard

The team conducted seven interviews that addressed Biotech & Life Sciences, including private employers, educators, and workforce development entities.

While many companies in this sector require specialized training and high levels of education to complete research, development, and other highly technical types of work, many of these same companies are also engaged in manufacturing and assembly that needs low- and middle-skill employees as well as people in the trades as factory/lab support staff (i.e., welders, electricians, HR, admin).

Challenges

- Small/nonexistent pipeline of workers
- Shift work is monotonous or physically demanding and the work is not appealing
- Entry-level wages are not competitive
- Lack of awareness among potential employees about opportunities in the sector and specific companies in the region. In particular, employers believe that many potential employees hear "biotech" and think that they are not qualified to work in the field.
- Not as much opportunity for remote work as other sectors
- Succession planning with an older workforce
- Retention and recruitment is a challenge when competing with some other areas of the country.
- Recruiting people in the trades as support staff (electricians, welders, maintenance, etc.)
- Workforce training programs provide some employees, but not the volume needed

Needs

- Production/manufacturing tech workers (entry-level)
- Engineers
- Chemists
- PhDs
- Support staff (trades expertise for plant maintenance, HR, admin, IT, etc.)

Of Note

Albany College of Pharmacy and Health Sciences Stack Family Center for Biopharmaceutical Education and Training is in its second year, training 8–10 students specifically for pharmaceuticals. They work closely with employers in the region, such as Lilly, Pfizer, Regeneron, and Curia.

New York State Industries for the Disabled (NYSID) facilitates a preferred source program for individuals with disabilities, working with 144 disability service providers. They believe the private sector is not aware of what NYSID can do for it in terms of diversifying the labor force. NYSID recommended as a strategy a priority program similar to MWBE, but for people with disabilities (and based on makeup of employees, not ownership). The state could also provide priority preference to companies that employ disabled populations through the Excelsior Tax Credit program (where employers are required to employ a certain number of people in exchange for tax relief).

What we discovered

The majority of the cluster's jobs are in high-skill occupations

The cluster has 167 occupations with at least 10 jobs

Occupational Mix:
- 17% Production occupations
- 15% Life, Physical, and Social Science occupations
- 14% Architecture and Engineering occupations
- 54% Other occupations

Low-Skill Occupations:
- 31% of the jobs in this cluster
- Wages range from $15.49–$52.02/hour
- 65% of jobs have above-average risk of automation

Middle-Skill Occupations:
- 11% of the jobs in this cluster
- Wages range from $18.55–$45.47/hour
- 40% of jobs have above-average risk of automation

High-Skill Occupations :
- 58% of the jobs in this cluster
- Wages range from $22.60–$85.21/hour
- 0% of jobs have above-average risk of automation

Significant gaps across all occupations, particularly among high-skill jobs

Projected workforce gap (2022–2032): (15,619)

Openings – Change in Labor Force = Workforce Gap
15,084 – (535) = (15,619)

Gaps projected across all 167 occupations in the cluster; gaps are widely dispersed (i.e., no one occupation accounts for more than 3% of the gap)

Of the projected workforce gap:
- 37% are Low Skill
- 12% are Middle Skill
- 51% are High Skill

The 9 Top Gap Occupations are plotted on the next page

- Low-skill occupations provide potential for career progression and substantial earnings increase without any further education
- No middle-skill jobs among the Top Gap Occupations
- The high-skill occupations all require a Bachelor's degree

Major skills gaps for common skills

There are 43 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Common Skills are the most in-demand by employers and have the largest gaps.

Top Skills Gaps:
- *Common Skills:* Communications, Customer Service, Management, Sales, and Operations
- *Specialized Skills:* Merchandising, Selling Techniques, Auditing, Accounting, Finance
- *Qualifications:* Basic Life Support, Bachelor of Science in Nursing, Advanced Cardiovascular Life Support, Security Clearance, Scrum (software development)

There are robust training programs in place for high-skill occupations

5 of the 9 Top Gap Occupations require beyond a HS education for entry

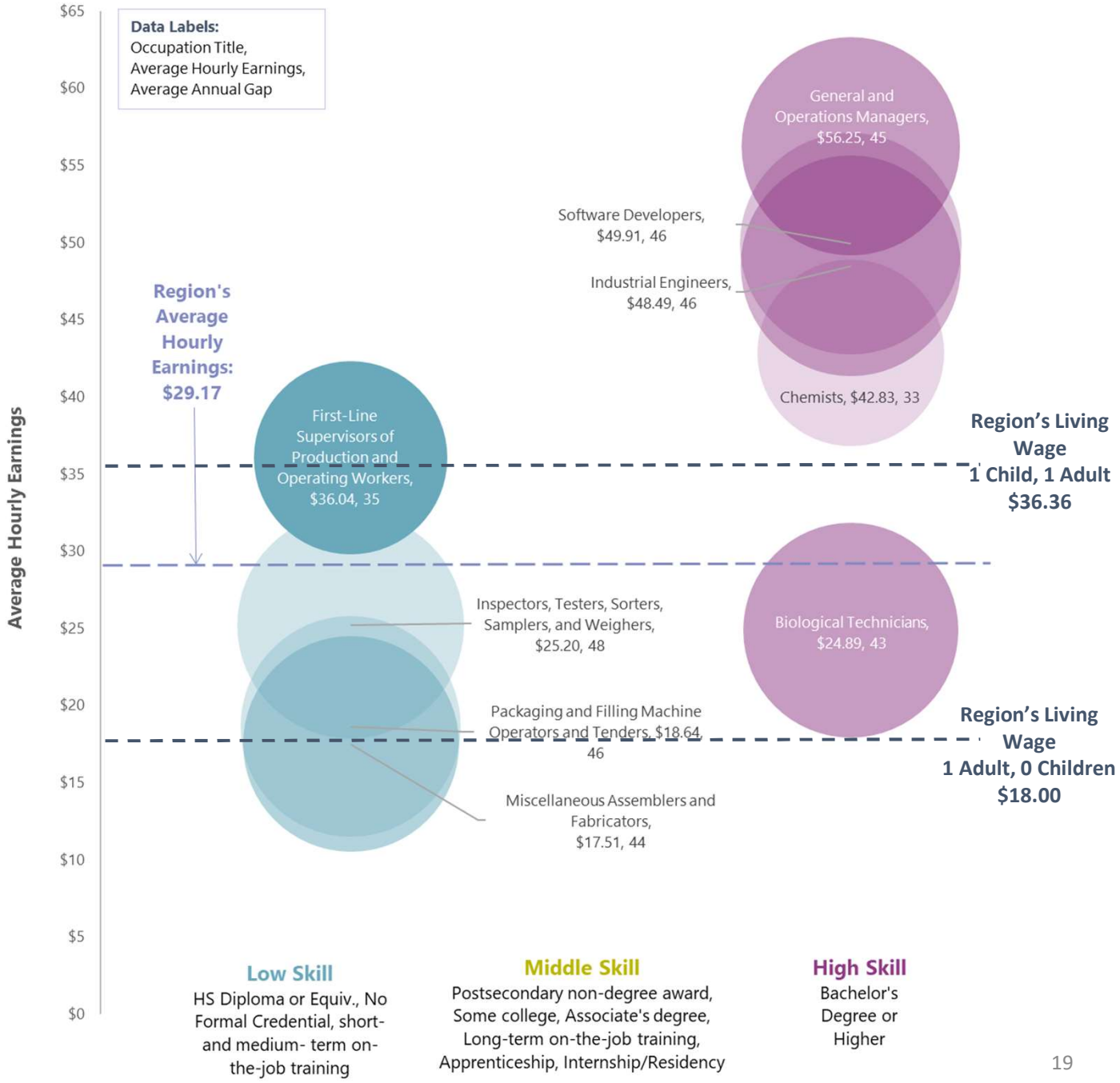
Types of Programs:
- *Higher Education:* 223 active training programs related to the Top Gap Occupations, producing an average of 5,707 graduates who are likely to remain in region; however, this cluster will likely have to compete across all other industries for these workers
- *Apprenticeships:* none
- *Certifications:* none
- *Other Training Programs:* 1 for Software Development (unknown completions)

More information needed regarding employer need and capacity for training programs for low- to middle-skill occupations

Top Gap Occupations

The occupations with the largest gaps are plotted below by **Skill Level** (x axis, coded by color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 9 occupations account for 24.7% of the total gaps anticipated in this Cluster. None of them are Middle-Skill occupations. See appendix for more detail on the Top Gap Occupations.

Top Gap Occupations: Biotech & Life Sciences



Themes in Biotech & Life Sciences

The following themes emerged specific to the Biotech & Life Sciences Sector:

Occupation gaps are spread relatively evenly across the cluster.

The top gap occupations in the Capital Region's Biotech and Life Sciences cluster are all projecting a gap of between 30–50 job openings annually. In other words, there is not a single standout occupation that is in high demand, there are relatively even gaps across the sector for low-skill and high-skill occupations.

Bioprocessing and biomanufacturing is a significant need.

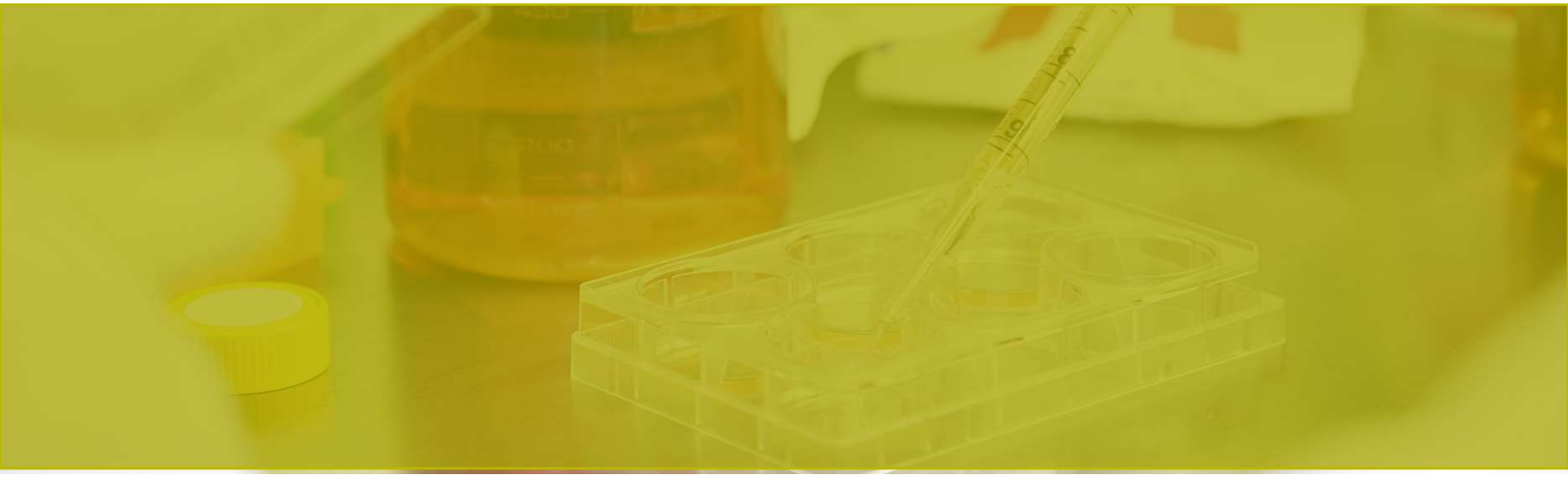
Employers noted that this sector needs individuals with bioprocessing and biomanufacturing skills, which is classified as "Biological Technicians" in the data, with 43 annual openings through 2032.

Sector changes quickly and it is difficult to stay on top of trends.

More efficient lines of communication between employers, employees, and educators are needed to keep pace with the rapid rate of innovation and growth in this sector.

Low-skill occupations have below-average hourly earnings.

Low-skill occupations in manufacturing and processing have very low wages compared with the region's average earnings, which can make it hard to attract and retain low-skill workers. However, decent career progression can be had in this sector, even without a formal education.



Implementation Plan: Biotech & Life Sciences

The Biotech & Life Sciences implementation strategy recommends a series of projects and initiatives to develop the pipeline of workers.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Strategy	Description	Partners
2.A	Communicate about career opportunities for all	Create stronger communication channels to better connect with the labor force and escalate collaboration among service providers.	Biotechnology Industry Organization, Pharmaceutical Research & Manufacturers of America, MedTech, Employers, Higher Education Institutions
2.B	Develop the early talent pipeline (i.e., youth)	Strategies to increase young people's awareness about diverse opportunities in Biotech & Life Sciences to attract more people to the sector.	Department of Education, K-12 Educators, Parents, Employers
2.C	Expand training capacity to support Biotech & Life Sciences pipeline	Strategies to increase the capacity and number of feeder programs into the Biotech & Life Sciences sector to grow the pool of work-ready employees and fill entry-level positions for industry partners.	SUNY Adirondack, Capital Region BOCES, Hudson Valley Community College (HVCC), Albany College of Pharmacy and Health Sciences, Future Skills Exchange

Communicate about career opportunities for all

STRATEGY 2.A

Create stronger communication channels to better connect with the labor force and escalate collaboration among service providers.

ACTION 1

Coordinate with industry organizations and higher education for content

Industry organizations. Connect with national and regional industry organizations and area colleges and universities as prime sources of information about career opportunities. Develop partnerships with these organizations to engage the current and potential workforce. Larger employers likely have strong connections into these organizations and can facilitate local connections to ensure information is reaching the Capital Region workforce.

Possible industry organizations to partner with include Biotechnology Industry Organization, MedTech, and the Pharmaceutical Research & Manufacturers of America.

ACTION 2

Ensure the message is reaching the targeted audience

General public. Utilize social media and traditional media to educate the public about industry, occupations, and career pathways. All the exciting projects happening in the region across the economy can dilute sector-specific news. Keep Biotech & Life Sciences top-of-mind for the public through consistent, ongoing communication strategies that promote activity and opportunities.

Future workforce. Train employers on how to utilize new and emerging social media platforms to connect with potential workers "where they are at." For example, young people are generally on TikTok and Instagram, not LinkedIn, while their parents are typically Facebook users.

Marketing segments. Develop a segmented distribution list of community leaders, guidance counselors, church groups, youth groups, libraries, and other service providers who work directly with youth and disadvantaged populations and feed them content about career opportunities in Biotech & Life Sciences and ask them to share with their client and student networks.

ACTION 3

Communicate about what matters to the target audience

Strategic messaging. Communicate about compensation in comparison with typical 4-year degree professions, career progression, ownership opportunities, value in the marketplace, and apprenticeship or internship opportunities. These are the themes that will connect with young potential employees and should be highlighted in marketing campaigns.

Develop the early talent pipeline (i.e., youth)

STRATEGY 2.B

Increasing the awareness of young people about diverse opportunities in Biotech & Life Sciences can attract them to the sector.

The range of occupations and potential career pathways in biotech and life sciences are not something most highschoolers are aware of. These strategies are designed to inform and inspire the near-future workforce at the point in their lives when they are deciding which direction to take.

ACTION 1

Expand job shadowing, internship, and summer job opportunities for high school students

Digital portal. Utilize a digital platform to connect students with internship and apprenticeship opportunities at local employers throughout the region.

Facilitate connections. Make it easier for employers to host students by helping to facilitate and market summer opportunities. Invite students who have participated in years prior to speak directly with prospective students and/or create video content to promote the programs available.

Professional networks. Help students build professional networks as a central component of these opportunities. Assign each student a trained mentor and encourage students to stay connected with the individuals they worked with.

Possible Partner: Future Skills Exchange

Lack of a professional network was identified as a top barrier for employees in the 2021 labor force survey.

ACTION 2

Host sector-specific career fairs

Immersive experiences. Host at employers' sites or maker spaces to provide a more exciting perspective into the sector. In addition to events for high school students, work with K-12 to develop field trips for elementary school children to visit local employers.

Broad invite. Invite students and their parents. Parents play a significant role in guiding their children toward different career pathways, and long-held perceptions and/or lack of awareness must be addressed.

Also include career counselors, school board members, and coaches—anyone who engages students in discussions about career and education planning. Consider inviting adults who engage with students in more casual settings but on a daily basis, such as coaches, aides, bus drivers, and people working in facilities departments.

ACTION 3

Strengthen partnerships with K-12 and colleges and universities

Engaged educators. Ensure people directly advising students about their education and career choices are educated about the Capital Region's growing Biotech Hub. Connect with career counselors and school boards through annual educator summits with local employers.

Develop and expand programs for educators to earn Continuing Education credit by working at Biotech businesses over the summer. Having these experiences will allow educators to better promote the industry to students.

Possible partner: Department of Education

Expand training capacity to support Biotech & Life Sciences pipeline

STRATEGY 2.C

Increasing the capacity and number of feeder programs into the Biotech & Life Sciences sector will grow the pool of work-ready employees and fill entry-level positions for industry partners.

ACTION 1

Create a pre-apprenticeship bootcamp program for Biomanufacturing

Biomanufacturing bootcamp. Work in partnership with area employers to develop a pre-apprenticeship bootcamp for high school students and young adults that introduces them to careers in the Biomanufacturing sector. Provide candidates with an understanding of the terms and concepts of this field, equip them with the basic skills of the industry, and prepare them for interviews with potential employers.

Targeted marketing. Prioritize postsecondary-GED/high school graduates, veterans, associate degree holders, women, people of color, and immigrants/refugees.

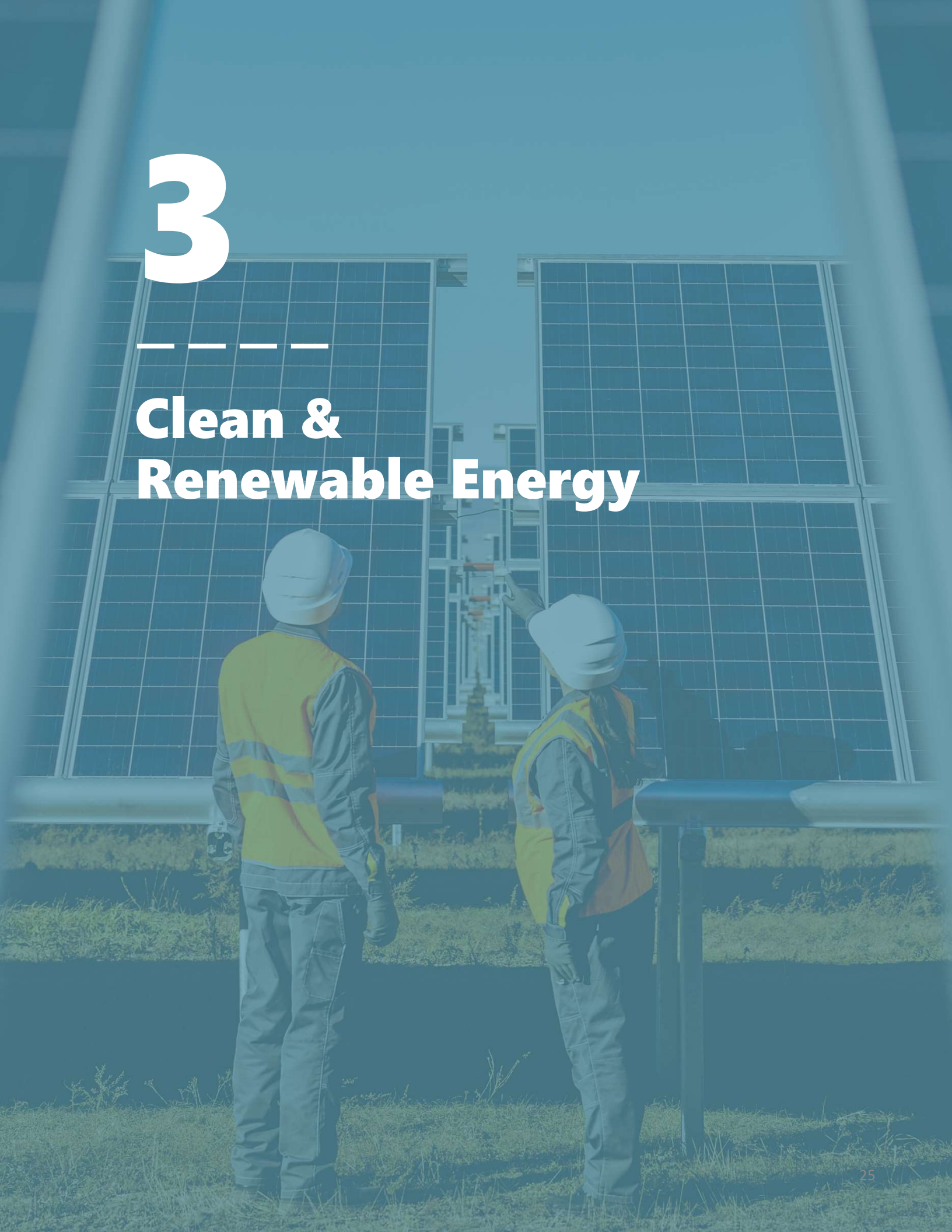
Wraparound services. Integrate with regional job boards and wraparound services to expand outreach to the underserved communities.

ACTION 2

Expand dual enrollment opportunities

Work-based learning. These programs allow students to earn college credit while participating in work-based learning projects and industry challenges, as well as develop mentor relationships with professionals in the field.

Any new training program should coordinate with the Office of the Professions to approve curriculum.



3

Clean & Renewable Energy

Clean & Renewable Energy Background

Purpose

This workforce strategy for Clean & Renewable Energy builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of Clean & Renewable Energy businesses in the Capital Region.

Sector Definition

The Clean & Renewable Energy sector includes businesses involved in the R&D, generation, storage, and transmission of energy derived from renewable, zero-emission sources (biomass, geothermal, hydropower, solar, and wind). It also includes businesses that manufacture and install the parts and components required for capturing and transforming energy.

Companies Engaged

Employers interviewed include:

- **Plug Power**
- **EVRedi (Livingston Energy)**
- **Port of Albany**

Why Clean & Renewable Energy?

The Clean & Renewable Energy sector is a critical element of the Capital Region's economy.

Significant Employment

23,522

jobs, 4% of the region total

Specialized Cluster

3.72

average LQ*, highest subsector LQ 20.35

Notable Businesses

882

establishments, 2.9% of all establishments

* Location Quotient (LQ) measures the region's industrial specialization relative to the U.S.

Industry Assets

The Capital Region has emerged as a leading East Coast offshore wind component manufacturing hub, adding to its established reputation as a leader in wind energy research and development.

The region is home to several leading academic resources including the Rensselaer Polytechnic Institute's Center for Future Energy Systems and the University at Albany's New York State Center of Excellence in Weather & Climate Analytics, which includes the Atmospheric Sciences Research Center.

In addition to offshore wind development, the Capital Region supports advancements in additional clean energy subsectors, including solar, battery/storage, geothermal and smart grid.

Of Note:
The University at Albany just launched a new AI supercomputing initiative to become the first university-based computer to reach a quintillion computations per second. Additionally, Rensselaer Polytechnic Institute announced the launch of the Rensselaer Institute for Data, Artificial Intelligence and Computing. These significant investments in next-generation AI will contribute to talent attraction and retention.

"There's not a skilled workforce because it's a new workforce that is needed. We are looking for new people with basic skills that can be trained from the ground up."

What we heard

Employers in this sector noted the fast pace of growth and change in this sector and the difficulty of attracting employees with an "entrepreneurial, growth" mindset and the needed multidisciplinary technical skills. At the same time, employers said that a large proportion of their workforce needs skills but not necessarily a college degree.

Challenges

- Low or nonexistent pipeline of workers
- New type of work and therefore, new type of workforce needed
- Difficult to offer remote opportunities
- Bureaucracy and slow pace of state workforce training programs
- Competition for higher wages and benefits
- Lack of experienced workers, which requires in-house training programs
- Not enough journeymen to support apprentices to fill the employee pipeline (due to regulated ratios on sites, especially electrical)
- Workforce development is decentralized in the region due to geography and multiple municipalities (four midsize urban centers), which can make it difficult to efficiently use the resources

Needs

- Entry-level, straight from school
- Middle-skill labor pool (finding technicians with experience)
- Electricians
- Material scientists
- People with clean room training
- People with a growth mindset due to rapid change and growth in the sector, as well as people who can work in a fast-paced, agile, start-up environment
- Electrical and chemical engineers
- "Electromechanical Technicians"

"A big challenge is the availability of talent. Competition is fierce. There are bigger sign-on bonuses and more flexible arrangements, especially for engineers and entry-level talent. Experienced people are hard to get, so we have to train and mentor."

What we discovered

The majority of the cluster's jobs are in high-skill occupations

The cluster has 201 occupations with at least 10 jobs

Occupational Mix:
- 20% Architecture and Engineering occupations
- 12% Production occupations
- 11% Construction and Extraction occupations
- 57% Other occupations

Low-Skill Occupations:
- 28% of the jobs in this cluster
- Wages range from $15.49–$52.02/hour
- 63% of jobs have above-average risk of automation

Middle-Skill Occupations:
- 22% of the jobs in this cluster
- Wages range from $20.01–$46.57/hour
- 66% of jobs have above-average risk of automation

High-Skill Occupations :
- 50% of the jobs in this cluster
- Wages range from $22.60–$85.21/hour
- 0% of jobs have above-average risk of automation

Significant gaps across all occupations, particularly among high-skill jobs

Projected workforce gap (2022–2032): (23,484)

Openings – Change in Labor Force = Workforce Gap
22,674 – (811) = (23,484)

Gaps projected across all 201 occupations in the cluster; gaps are particularly concentrated for Electricians (7.4% of the gap) but are otherwise widely dispersed (i.e., no other occupation accounts for more than 3.8% of the gap)

Of the projected workforce gap:
- 33% are Low Skill
- 24% are Middle Skill
- 43% are High Skill

The 12 Top Gap Occupations are plotted on the next page

- There appears to be a career pathway for Electrical Assemblers (HS diploma) to become Electrical Technicians (Associate's degree) and then to advance to a high-skill engineering job with the completion of a Bachelor's degree

Shortage of security clearances and other qualifications

There are 9 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Security Clearances (including Secret, Top Secret, and TS/SCI) are the most in-demand by employers and have the largest gaps. However, employers are generally willing to help workers achieve this qualification on the job.

Top Skills Gaps:
- *Qualifications:* Security Clearance, Scrum (software development), CompTIA Security+, Master of Business Administration, Certified Information Systems Security Professional, OSHA
- *Common Skills:* Problem Solving

There are robust training programs in place for high- and middle-skill Top Gap Occupations

8 of the 12 Top Gap Occupations require beyond a HS education for entry

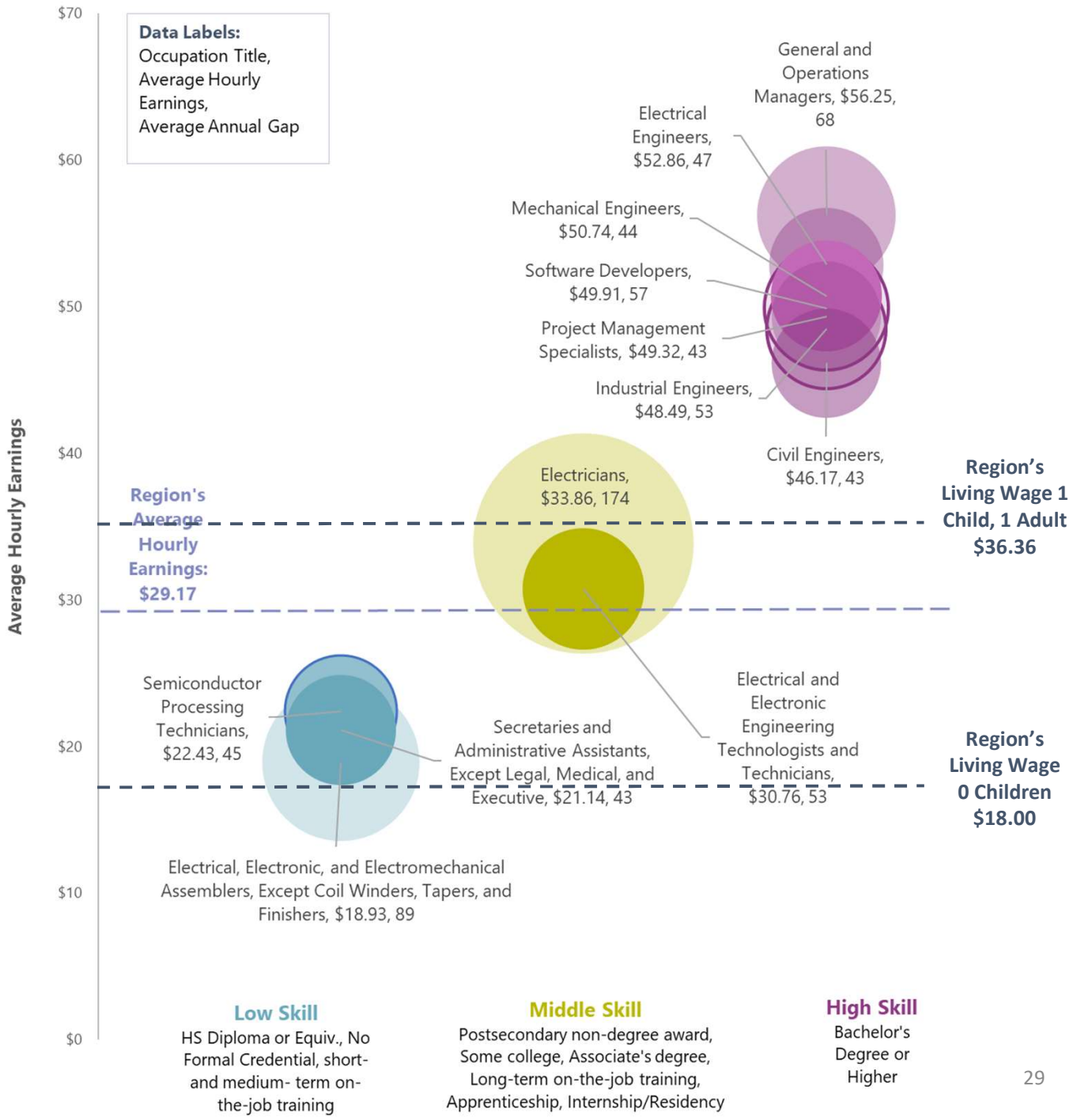
Types of Programs:
- *Higher Education:* 394 active training programs related to the Top Gap Occupations producing an average of 12,820 graduates who are likely to remain in region; however, this cluster will likely have to compete across all other industries for these workers
- *Apprenticeships:* 15 (13 for Electricians & 2 for Electrical Technicians; unknown completions)
- *Certifications:* 3 for Electricians (unknown completions)
- *Other Programs:* 3 for Electricians (unknown completions)

More information needed regarding employer need and capacity for training programs for low-skill occupations

Top Gap Occupations

The occupations with the largest gaps are plotted below by **Skill Level** (x axis, coded by color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 12 occupations account for 32.3% of the total gaps anticipated in this Cluster. See appendix for more detail on the Top Gap Occupations.

Top Gap Occupations: Clean & Renewable Energy



Themes in Clean & Renewable Energy

The following themes emerged specific to the Clean & Renewable Energy sector:

Not enough Electricians.

Data suggests that the Clean & Renewable Energy Cluster is in significant need of electricians to fill critical positions, estimating there is an annual demand for 174 electricians through 2032. Electrical Assemblers (89 jobs annually) and Technicians (53 jobs annually) are also projected to be in-demand. Additional formal training, on the job, and apprenticeship programs are needed to expand the pathway and address needs of the Clean & Renewable Energy Cluster.

More Engineers needed.

Several types of engineers are among the top gap occupations for the cluster, including industrial, electrical, civil, and mechanical engineers. Together, these occupations are expected to have a job gap opening of nearly 240 engineering jobs annually. Businesses from the sector specifically noted a shortage of chemical and electrical engineers.

Entrepreneurial people wanted.

Many employers noted that they are looking for people who have an entrepreneurial mindset. There are a lot of startup companies in this space, and technologies change quickly, so people who are adaptable problem solvers are highly sought after.

Implementation Plan: Clean & Renewable Energy

The Clean & Renewable Energy implementation strategy recommends a series of projects and initiatives to attract entrepreneurial-minded employees and close gaps in top occupations.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Strategy	Description	Partners
3.A	Promote meaningful careers of the future	Showcase the Clean & Renewable Energy sector as an exciting field looking for entry-level talent to increase the pipeline of workers.	Employers, CleanTech Alliance, New York Battery and Energy Storage Technology Consortium (NYBEST)
3.B	Create immersive opportunities to learn & develop skills	Strategies to create opportunities for future workers to meet, work alongside, and learn from people from the Clean & Renewable Energy Sector early in their career decision-making process to attract more people to the field and build a pool of workers.	BOCES, High Schools, DOL, Parents, coaches, and other adults who engage with students in career-path planning decisions
3.C	Fill gaps in top occupations	Expand training capacity and expand the region's talent attraction campaign to include data-driven targeted outreach to high demand gap occupations. The top gap occupation for Clean & Renewable Energy is electricians, followed by engineers (industrial, mechanical, electrical, and civil). Software developers are also in-demand for this sector.	NECA-IBEW Electrical Training Center, Local colleges and universities, Center for Economic Growth (CEG)

Of Note:
The Center for Economic Growth is the Capital Region's only Group Sponsor program for NYS Registered Apprenticeship Programs in Manufacturing and IT. Acting a direct link between companies and the NYS Department of Labor, CEG supports businesses, business leaders, and HR teams to design, implement, and manage their apprenticeship programs. NYS Registered Apprenticeship is a formal training program that combines on-the-job training with formal classroom education to prepare individuals to enter and grow in new careers.

Promote meaningful careers of the future

STRATEGY 3.A

Showcasing the Clean & Renewable Energy sector as an exciting field looking for entry-level talent will help increase the pipeline of workers.

As an emerging sector, the pipeline of workers for Clean & Renewable Energy occupations is extremely thin to nonexistent. This strategy is intended to connect with young people who are passionate about climate issues and invite them to be part of the solution.

ACTION 1

Launch a marketing campaign about what it takes to be in the Clean & Renewable Energy space

Future builders. Emphasize this sector as looking for people who want to be part of creating the future. Build on young people's desire to make positive change and be part of the solution.

Entrepreneurs. Also frame this sector as needing people who are entrepreneurial and will excel in a fast-paced, fluid, startup environment. "Calling all risk-takers and change-makers" etc.

Target. Middle and high school students should be the primary focus of this campaign. Use digital media platforms popular with this age group. Also work to connect with parents, coaches, educators, and Career Counselors.

ACTION 2

Connect with professional industry organizations for content to promote the sector

Connections. Ask major employers in the region which industry organizations they have strong connections with and ask for introductions.

Work with industry organizations for content that can be utilized in local marketing campaigns about the sector as well as best practice examples from other communities.

Possible industry organizations to connect with include CleanTech Alliance and New York Battery and Energy Storage Technology Consortium (NYBEST).

ACTION 3

Promote the Clean & Renewable industry to the public

Industry buzz. Utilize traditional and digital media to maintain "buzz" about the Capital Region's Clean & Renewable Energy industry with project updates, information about innovation, etc.

Partner with organizations such as the New York Battery and Energy Storage Technology Consortium (NYBEST) and NYSERDA on providing updates and information about what's happening in the region and across the state by making sure content produced by these entities is getting in front of the targeted audiences in the region.

Create immersive opportunities

STRATEGY 3.B

Creating opportunities for future workers to meet, work alongside, and learn from people from the Clean & Renewable Energy Sector early in their career decision-making process will attract more people to the field and build a pool of workers.

ACTION 1

Recruit employers to host career events onsite

Memorable events. Work with local employers to have career-fair style events where middle and high school students can visit employers and have an immersive experience to learn about what a career in Clean & Renewable Energy is like.

Invite parents, coaches, and other adults who engage with students in career-path planning decisions.

ACTION 2

Activate spaces for students and career counselors to engage with and work alongside professionals

Entrepreneurial places. Partner with the region's makerspaces and incubators, such as the Tech Valley Center of Gravity and S.T.E.A.M. Garden, to expand youth programs and begin to help young people interested in the Clean & Renewable energy sector start building a professional network—connect with local employers to have their staff participate in events. Develop summer internship opportunities for students and career counselors to learn about the industry.

Who's doing it well: Recharge Academy – Wind Win RI

ACTION 3

Expand dual-credit programs between high schools, BOCES, and postsecondary education

Dual track. These programs provide students an opportunity to obtain recognized credentials, allowing them to go straight into the workforce and/or get a jumpstart on postsecondary education.

ACTION 4

Increase apprenticeship opportunities in Clean & Renewable Energy

IRA apprenticeships. Under the Inflation Reduction Act (IRA), to receive tax benefits, companies are required to employ a certain number of apprentices, registered in the U.S. DOL Registered Apprenticeship Program. Work with local companies to create apprenticeship opportunities, have them registered, and promote these opportunities to underserved populations.

Of Note: The Multi-Craft Apprenticeship Preparation Program (MAPP) is a New York State not-for-profit organization that provides hands-on training and education in the construction trades to historically under-served populations. MAPP works in partnership with local trade unions to address the historic lack of diversity within the building trades, while simultaneously providing a solution to the critical shortage of skilled labor. MAPP began in Rochester NY in 2017 and launched in the Albany area on October 8, 2021. Working with the City of Albany Land Bank, MAPP is actively working to improve the community landscape by rehabilitating a blighted building in the downtown area with work completed by program participants, giving them hands on work experience.

Fill gaps in top occupations

STRATEGY 3.C

Expanding training capacity and enhancing the region's talent attraction campaign can help quickly meet the need to fill top gap occupations.

The top gap occupation in Clean & Renewable Energy is electricians, followed by engineers (industrial, mechanical, electrical, and civil). Software developers are also in-demand for this sector.

ACTION 1

Fill the gap in electricians

Capacity Expansion. Continue to support NECA-IBEW Electrical Training Center in their search for a new training facility that will allow them to expand capacity of training programs.

Underrepresented populations. To encourage a more diverse workforce, create an outreach program to connect with female, minority, and veteran apprentices and journeyman training. Make it easier for people to request a job shadow and spend an hour on the job site.

Promote perks. Starting pay is competitive—$18/hour plus benefits, which increases in 6 months and reaches $80,000 by 5 years. No student loans.

Equity. Include DEI training as part of the curriculum.

Stay connected. Approximately 50% of apprenticeship candidates do not pass the entry test and are lost. Develop a program to stay connected with these candidates and redirect them to other trades such as linesmen, tele data installers, etc. and/or help them better prepare for the entry test.

Who is doing it well: Clean Tech Institute | Training | Train The Trainer in Clean Tech Industry, M.A.P.P.

ACTION 2

Expand the region's talent attraction campaign for high-skilled gap occupations

Targeted recruitment. Top gap occupations such as software developers and industrial, mechanical, electrical, and civil engineers can be filled through a data-driven attraction campaign as a complementary strategy to local talent development.

Begin by conducting a geographic competitive analysis. Develop a set of variables for each target occupation where the Capital Region may be able to compete with other areas across the U.S. Examples include wages, cost of living, jobs in the industry, number of businesses in sector, etc.

Examine data from regions across the United States to see where conditions are most favorable for the Capital Region to compete with other geographies for each targeted occupation. Prioritize regions where the Capital Region may be able to recruit workers to fill local gap occupations. Target campaigns geographically. Employ a multiplatform digital campaign and track in real time.

Partners. Expand existing Graduate Retention Pilot, led by CEG, to integrate talent attraction and retention messaging into partner college and university wen, email, and social media communications. Focus on lifestyle, job opportunities, and professional development / networking.

Expand the region's Intern Engagement Program, led by CEG, to partner more closely with industry and deliver events and messaging to interns on lifestyle, job opportunities, and processional networks.

Host organized receptions around events that attract a large number from outside the region to deliberately pitch the Capital Region as an ideal place to live and advance a great career.

ACTION 3

Continue to monitor and meet the need for welders

Advance programs as needed. There are several planned and potential projects that, if they occur, will dramatically increase the need for skilled welders. CREDC's 2022 Progress Report noted the need to increase the welder talent pipeline, and CEG and the WIB have prioritized connecting justice-involved individuals into training programs.

4

IT, Software, & Electronics

Of Note:
In 2020, AlbanyCanCode, a nonprofit dedicated to creating a new generation of software coders, set out to accelerate the organization's expansion across New York State, increase access to computer coding and technology training programs for underserved individuals, and further grow the pipeline of skilled technology professionals. Since 2016, AlbanyCanCode has grown from a local pilot program into CanCode Communities, an organization committed to increasing access to technology training and computer literacy for underserved individuals of all ages in the Capital Region and beyond.

From 2016 to 2022, CanCode Communities has gone from ground zero to:

- Thousands of young people who have come to see themselves as aspiring coders through computer science exposure in their classrooms;
- Hundreds of adult learners who have applied and been accepted, funded, and enrolled in Digital Literacy and Software Training classes;
- Over 50 employer, educator, and community allies we engage with to brainstorm, pilot, measure, and refine programs to build a diverse and talent-fueled technology pipeline;
- Dozens of public-school administrators and teachers who pilot and support K-12 coding-for-all programs in their schools; and
- New technologists, in higher salaried positions who would not have otherwise been hired to these jobs.

IT, Software, & Electronics Background

Purpose

This workforce strategy for IT, Software, & Electronics builds off the Regional Workforce Inventory completed by the Regional Council.

What follows are solution-driven approaches for workforce development and a roadmap for how to address the needs of IT, Software, & Electronics businesses in the Capital Region.

Sector Definition

The IT, Software, & Electronics industry in the Capital Region includes companies focused on power electronics, wafer processing and manufacturing, lithography tooling, compound semiconductor research and applications, data analytics, artificial intelligence, gaming, information technology, and software industries. This sector combines the region's previously identified Tech & Electronics sector and the Software, IT, & Digital Game Development sector due to their significant overlap in staffing patterns. The Software, IT, & Digital Game Development component accounts for 34% of the jobs, 77% of its growth, and 66% of the businesses for this combined sector.

Companies Engaged

Companies that were interviewed for this work include:

- **Global Foundries**
- **Simmons Machine Tool Corp.**
- **Ames Goldsmith**
- **Pallidus**
- **Kitware**

Why IT, Software, & Electronics?

The IT, Software, & Electronics sector is a notable element of the Capital Region's economy.

Significant Employment

28,060

jobs, 5% of the region's total employment

Notable Businesses

1,475

establishments, 7.9% share of total

Strong Growth

862

jobs added 2017–2021, 3% growth rate

Industry Assets

The region is ripe with resources, including the University of Albany College of Emergency Preparedness, Homeland Security and Cybersecurity, the nation's first standalone college dedicated to the topics of emergency preparedness, homeland security and cybersecurity. Several of the top game design, training, and apprenticeship programs feed students into the talent pipeline of the region.

The region is home to The Albany NanoTech Complex, a fully integrated research, development, prototyping, and educational facility that provides strategic support through outreach, technology acceleration, business incubation, pilot prototyping, and test-based integration support for onsite corporate partners.

"A lot of people don't know what we do, and they think they need an advanced degree. But they don't."

What we heard

The team conducted five interviews that addressed this sector, including private employers, educators, and workforce development entities.

Challenges

- Finding people for technician roles (for support, repair, and maintenance). All companies are pulling from the same labor pool
- Awareness among local population of the kinds of engineers needed (chemical and electrical), but also that only 40%–50% of employees even need to have a bachelor's degree
- Low or nonexistent pipeline of workers
- Regional competitiveness in retaining and recruiting employees is a challenge
- Low enrollment in workforce development programs at community colleges and universities

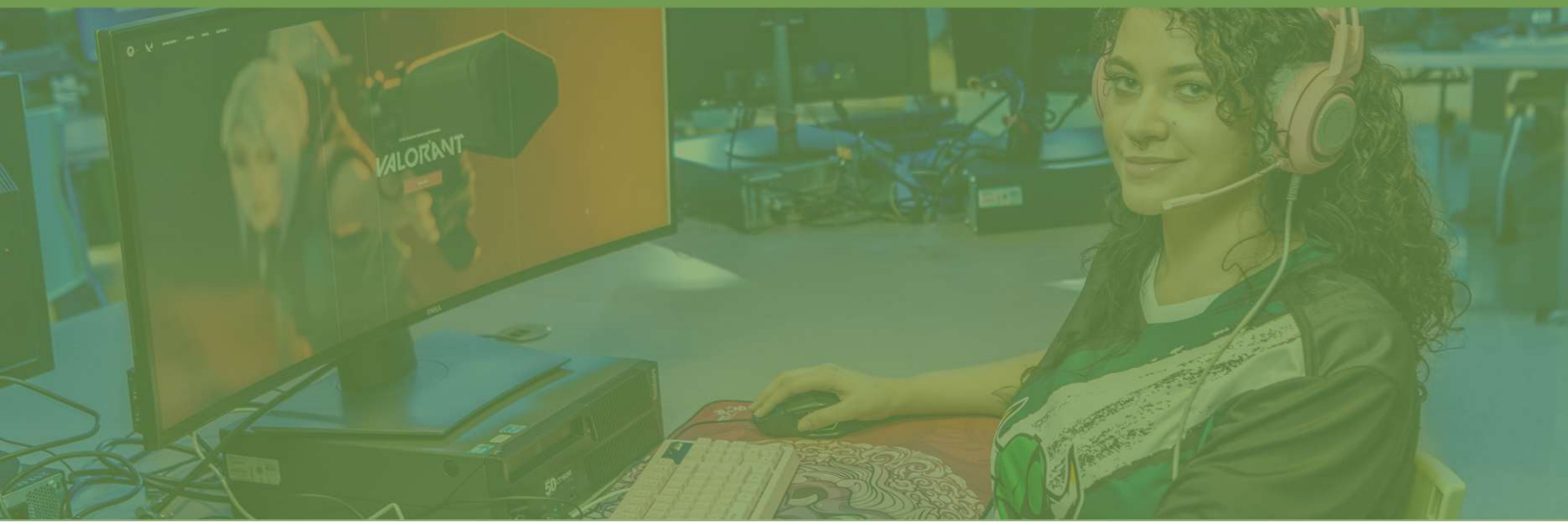
Needs

- Engineers
- Technicians
- Middle-skill labor pool—finding technicians with experience
- PhDs

Of note

In partnership with Global Foundries, HVCC North developed a Workforce Training and Apprenticeship Center, which offers credit and noncredit workforce training programs and apprenticeships as well as associate degree programs (for instance Electrical Engineering Technology, Semiconductor Manufacturing, Mechatronics).

"We like to hire [technicians] from this region, but people don't realize they can do that work. It's a struggle. People just don't know about the need or career growth opportunities. The pipeline is just not big enough for us."



What we discovered

The majority of the cluster's jobs are in high-skill occupations

The cluster has 195 occupations with at least 10 jobs. The Software, IT, & Electronics sector is well represented within the staffing pattern of the combined cluster, with 4 of the top 15 occupations overlapping.

Occupational Mix:
- 20% Computer and Mathematical occupations
- 16% Architecture and Engineering occupations
- 12% Business and Financial Operations occupations
- 52% Other occupations

Low-Skill Occupations:
- 22% of the jobs in this cluster
- Wages range from $15.17–$52.02/hour
- 37% of jobs have above-average risk of automation

Middle-Skill Occupations:
- 15% of the jobs in this cluster
- Wages range from $20.01–$52.30/hour
- 40% of jobs have above-average risk of automation

High-Skill Occupations:
- 63% of the jobs in this cluster
- Wages range from $22.60–$85.21/hour
- 0% of jobs have above-average risk of automation

Significant gaps across all occupations, particularly among high-skill jobs

Projected workforce gap (2022–2032): (29,445)

Openings – Change in Labor Force = Workforce Gap
28,395 – (1,050) = (29,445)

Gaps projected across all 195 occupations in the cluster; gaps are particularly concentrated for Software Developers (7.7% of the gap) but are otherwise widely dispersed (i.e., no other occupation accounts for more than 4.3% of the gap).

Of the projected workforce gap:
- 26% are Low Skill
- 16% are Middle Skill
- 58% are High Skill

The 10 Top Gap Occupations are plotted on the next page

- There appears to be a career pathway for Customer Service Representatives (HS diploma) to become Computer User Support Specialists (some college) and then to advance to a high-skill technical job with the completion of a Bachelor's degree
- 8 of the Top Gap Occupations are among the top occupations in the staffing pattern for the Software, IT, & Digital Gaming sector

Shortage of Security Clearances and other qualifications

There are 7 skills categories where employer demand exceeds worker supply, based on online job postings and worker profiles.

Security Clearances (including Secret, Top Secret, and TS/SCI) are the most in-demand by employers and have the largest gaps. However, employers are generally willing to help workers achieve this qualification on the job.

Top Skills Gaps:
- *Specialized Skills:* none
- *Qualifications:* Security Clearance, Scrum (software development), CompTIA Security+, Master of Business Administration, Certified Information Systems Security Professional, OSHA
- *Common Skills:* Problem Solving

There are robust higher education training programs in place across all skill levels for the Top Gap Occupations

6 of the 10 Top Gap Occupations require beyond a HS education for entry

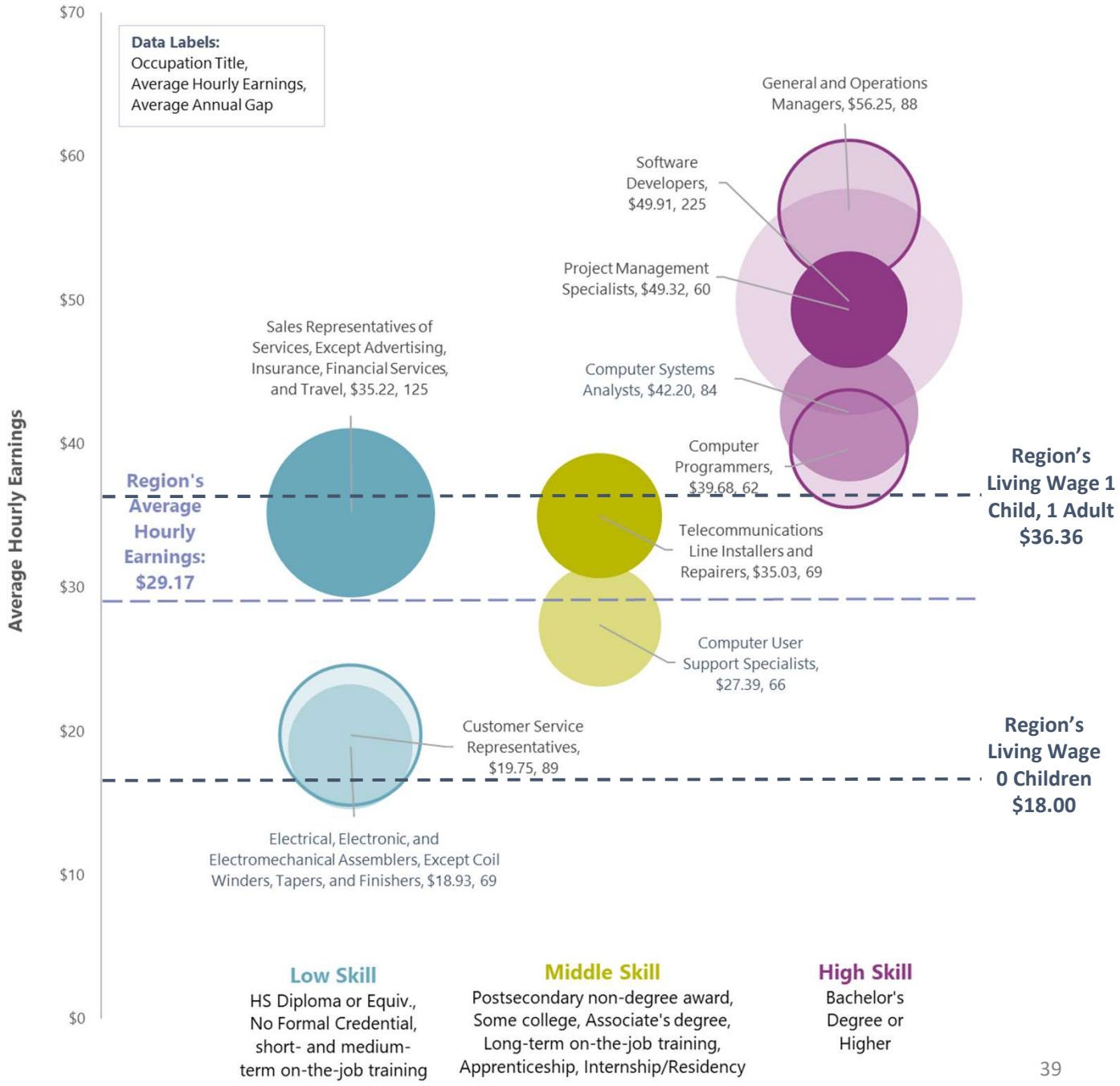
Types of Programs:
- *Higher Education:* 555 active training programs related to the Top Gap Occupations producing an average of 19,143 graduates who are likely to remain in region (however, this cluster will be competing with all other industries for these workers)
- *Apprenticeships:* 1 (Computer User Support Specialists; unknown completions)
- *Certifications:* none
- *Other Programs:* 3 (1 for Software Developers, 2 for Computer Programmers; unknown completions)

More information needed regarding employer need and capacity for training programs for low- to middle-skill occupations

Top Gap Occupations

The occupations with the largest gaps are plotted below by **Skill Level** (x axis, coded by color), **Earnings** (y axis), and **Projected Average Annual Workforce Gap** (bubble size), with average hourly earnings and the gap included in the data labels. These 10 occupations account for 31.9% of the total gaps anticipated in this Cluster. See appendix for more detail on the Top Gap Occupations.

Top Gap Occupations: IT, Software & Electronics Cluster



Themes in IT, Software, & Electronics

The following themes emerged specific to the IT, Software, & Electronics sector:

Software developers are in high demand.

There is a projected need for 225 software developers annually in the region, totaling 2,255 jobs by 2032. Computer programming and system analyst occupations are also among top gap occupations for this cluster.

Sales representatives, customer services representatives, and other customer-facing jobs are critical.

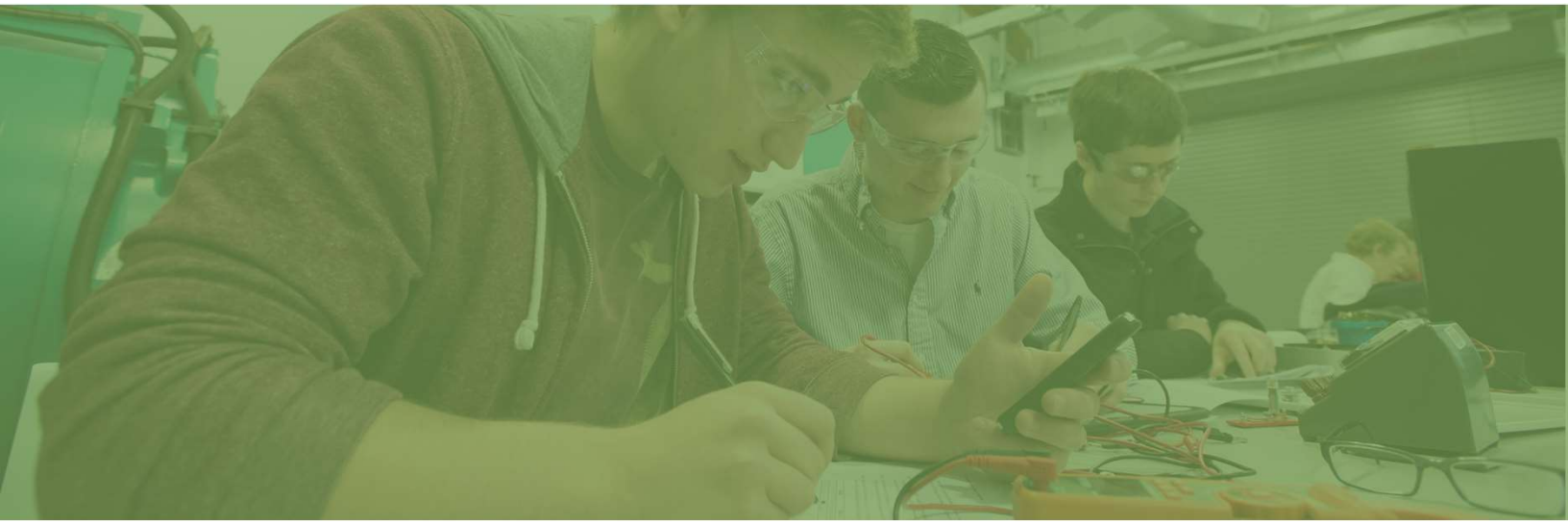
Perhaps a less obvious need in this sector is for a significant number of sales representatives, which are projected to have a gap of 125 jobs annually through 2032, and customer service representatives, which are expected to have an annual job gap of 89 jobs over the next 10 years.

Communication between industry and education providers lags.

Skills and training needs in the IT, Software, & Electronics sector change quickly, and employers noted that training providers sometimes struggle to keep up with the needs of the private sector. Employers tend not to have strong connections with local community colleges or training providers, but when they do find a good contact and an "in" with students, it has proven beneficial for recruitment.

Female participation rates are low.

Female participation rates in this sector are especially low across most of the occupation categories.



Implementation Plan: IT, Software, & Electronics

The IT, Software, & Electronics implementation strategy recommends a series of projects and initiatives to diversify the labor pool by creating a more inclusive workplace and increasing access to training for software development and customer service skills.

These recommendations align with the needs and opportunities identified throughout the planning process as well as the stakeholder feedback.

#	Strategy	Description	Partners
4.A	Communicate that IT is for everyone	Sending the message that the IT sector is for anyone, and everyone, to put the sector in a more open and welcoming light, expanding the workforce.	Career Counselors, community leaders, guidance counselors, church groups, youth groups, libraries, and other service providers
4.B	Increase participation of underserved populations in IT, Software & Electronics	Prioritizing equity and flexibility to attract, and retain, more women and BIPOC individuals in the IT, Software, & Electronics industry to increase the pipeline of qualified workers.	Girls Who Code, CanCode Communities
4.C	Fill the gap in Software Developers of today, and tomorrow	Strategies to align industry needs for software developers and the training system to accelerate the process of filling these positions.	Employers, Workforce Boards, Training Providers
4.D	Meet the need for customer-facing occupations	Upskilling retail workers with IT skills to create career pathways and opportunities to advance for individuals who may be "stuck" in service jobs that may be at risk for automation.	Employers, Workforce Boards, Training Providers

Of Note:
Career Jam is a highly successful career exploration event that has been held over the last few years in the Capital Region. Career Jam allows middle school students to engage directly with area employers. This type of event can be expanded upon and elevated, for example, inviting parents to participate.

Communicate that IT is for everyone

STRATEGY 4.A

Sending the message that the IT sector is for anyone and everyone will put the sector in a more open and welcoming light, expanding the workforce.

ACTION 1

Launch a marketing campaign that highlights the array of opportunities in IT, Software, & Electronics

Key messaging. Promote the varied level of education and skill requirements needed and emphasize that programs and training are available. Send the message that anyone can find success in this sector.

Promote the flexibility and range of career opportunities across the economy available to individuals with IT skills.

Also emphasize the flexibility in lifestyle that a career in IT can offer (i.e., remote or hybrid work).

Targeted audience. Target middle and high school students using digital media platforms that they are using, as well as parents and Career Counselors.

ACTION 2

Customize messaging around what matters to the target audience

Content. Communicate about compensation in comparison with typical 4-year degree professions, career progression, ownership opportunities, value in the marketplace, and apprenticeship or internship opportunities. These are the themes that will connect with young potential employees and should be highlighted in marketing campaigns.

ACTION 3

Ensure information about careers in IT, Software & Electronics is reaching underrepresented populations

Marketing segments. Develop a segmented distribution list of community leaders, guidance counselors, church groups, youth groups, libraries, and other service providers who work directly with youth and disadvantaged populations and feed them content about career opportunities in IT, Software, & Electronics and ask them to share with their client and student networks.

ACTION 4

Expand awareness of internship opportunities

Digital portal. Utilize a portal for companies to post internship opportunities and students to browse opportunities. This single digital hub will serve as a central location where people interested in IT, Software, & Electronics careers can go to find information, connect with professionals, etc. Handshake is currently in-use in the region by area colleges and can be expanded upon.

Remote workers. Allow students from outside of the region to engage in remote internships to expand talent attraction.

Increase participation of underserved populations in IT, Software & Electronics

STRATEGY 4.B

Prioritizing equity and flexibility will help to attract, and retain, more women and BIPOC individuals in the IT, Software, & Electronics industry, increasing the pipeline of qualified workers for this sector.

ACTION 1

Amplify STEM programs for middle and high school girls

Ecosystem assets. Partner with the region's makerspaces, incubators, accelerators, libraries, and co-working spaces to expand events and training opportunities for young women and girls to gain exposure to the sector and begin building their professional networks.

Girls Who Code is one program that can be amplified and expanded throughout the region, partnering with local public libraries.

Key to realizing this economic diversification strategy, especially through the creation of software-IT firms in rural areas, is the expansion of high-speed broadband in rural areas. To accelerate broadband expansion, the region needs to train more telecommunications equipment installers, such as fiber splicers and linemen.

ACTION 2

Support and expand Albany CanCode

Software Developers. Albany CanCode is a local workforce development program that trains IT professionals. Most applicants are income-qualified. Partner with CanCode to connect applicants into wrap-around services (childcare, transportation, health services, etc.) to support their success in the program. Partner with local non-profits that provide services for underserved populations to promote the program.

Nine of the top ten gap occupations in the IT, Software, & Electronics sector have lower-than-average female participation rates.

Fill the gap in Software Developers of today, and tomorrow

STRATEGY 4.C

Aligning industry needs for software developers and training system will help accelerate the process of filling these positions.

ACTION 1

Host an annual workforce industry forum to discuss current and emerging tech trends

Emerging trends. Utilize this forum for the private sector employers to inform the workforce development system what key trends are on the horizon in the near-term and long-term so the workforce system can quickly ramp up and adapt training to meet ever-changing talent needs.

Discuss: Which jobs can be automated? Which skill sets are rising? What new skills are needed for existing employees? Etc.

ACTION 2

Understand and expand training program capacity

Capacity analysis. Poll training providers annually to determine capacity and needs. Create a standardized template for providers to provide information about:

1) existing programs that are not filled to capacity;

2) existing programs that are filled to capacity; and

3) programs that need to be developed to meet sector needs.

Strategy development. Utilize the information collected to set strategy and goals for the coming year, utilizing all tools available in the workforce development system including workforce boards, higher education institutions, and other partners in IT, Software & Electronics programming.

ACTION 3

Elevate ongoing talent attraction campaigns

Geographic targets. Conduct a geographic competitive analysis to identify where the Capital Region may be able to compete with other regions across the U.S. for software developers. Variables used to benchmark may include wages, cost of living, jobs in the industry, number of businesses in sector, sector growth, etc.

Examine data from regions across the United States to see where conditions are most favorable for the Capital Region to compete with other geographies and prioritize those regions to focus recruitment campaigns.

Targeted marketing. Utilize the competitive factors identified in the geographic competitive analysis to create messaging. Employ a multiplatform digital campaign and track engagement across platforms.

Partners. Explore opportunities with local colleges and universities to integrate talent attraction messaging into their web, email, and social media communications.

Host organized receptions around events that attract a large number from outside the region to deliberately pitch the Capital Region as an ideal place to live and advance a great career.

Meet the need for customer-facing occupations

STRATEGY 4.D

Upskilling retail workers with IT skills will create career pathways and opportunities to advance for individuals who may be "stuck" in service jobs that may be at risk for automation.

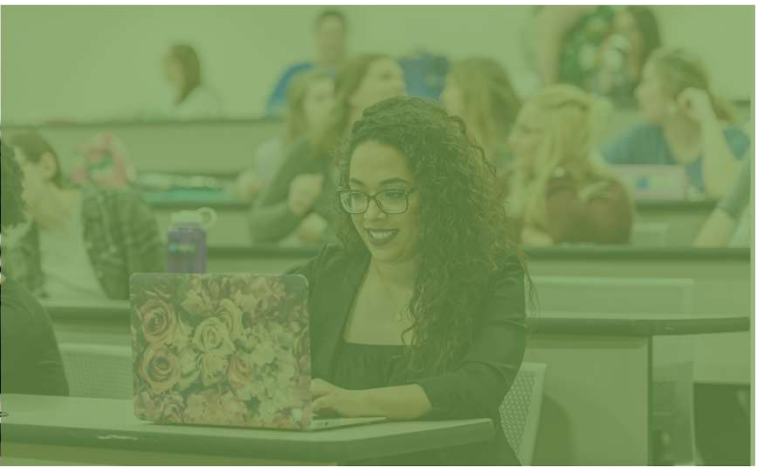
ACTION 1

Design a micro-credential training program to train retail workers for IT, Software, & Electronics jobs

Upskilling. Build on the customer service skills of people who work in retail and the service sector. Work in partnership with local workforce development boards and the private sector to create a program that can quickly upskill retail workers in direct response to the IT sector's needs.

Design a program that consists of stackable micro-credentials so people can 'test out' of classes they don't need and focus only on developing skills that are relevant.

Provide bilingual options for training.



ACTION 2

Implement an outreach campaign to displaced and high-risk service workers

Outreach. Connect with employees in retail environments that are at high risk of automation, such as fast-food establishments, or subject to significant shifts in workforce due to seasonality (e.g., holiday workers).

Equitable opportunities. Prioritize connecting with women and people of color about the upskill training. In addition to the training itself, take a wholistic approach and connect people with other services that they may need to succeed in the program (childcare, transportation, etc.).

Begin with employees of electronics and appliance stores who may already have some of these IT skills. This subsector is projected to decline by 32% or over 375 jobs in the next 10 years.

From 2022 to 2032, the number of retail jobs in the Capital Region is projected to decline by 2,392 (-4%). Retail is one of just two 2-digit sectors projecting a decline.

Currently, women hold 47% of the jobs in the retail sector and 20% of jobs are held by people of color.

5

Appendix

A: Regional Background Report

B: Top Gap Occupation Data

Appendix: A

Regional Background Report

Regional Background Report

Capital Region

Introduction

The purpose of this report is to provide background and context for the creation of targeted workforce development strategies for key, tradable industry clusters within the Capital Region.

This report includes brief overviews of the Region's:

- Demographics
- Economy
- Labor force
- Labor force demographics
- Underserved populations

Unless otherwise noted, all data within this report is for 2021 and sourced from Lightcast (formerly Emsi / Burning Glass)

Key Takeaways

- There are fewer millennials and a higher retirement risk than expected; some counties within the region are significantly older than the State and nation.
- While racial diversity is low, it is increasing faster than the State and is in line with national trends.
- Educational attainment is slightly lower than the State, but significantly higher than the nation; the high school graduation rate is slightly higher than the State's rate while dropouts are slightly lower.
- Poverty is relatively low while median household income varies widely across the region.
- From 2016 to 2019, jobs in the Capital Region were on the rise. The COVID-19 pandemic disrupted that trend, and the region is continuing to recover.
- While average earnings have increased significantly and are slightly higher than the national average, they are well below the State average (which are skewed by New York City residents).
- *Biological Product Manufacturing*, *Casino Hotels*, *Computer Systems Design Services*, and *Residential Intellectual and Developmental Disability Facilities* are some of the Region's top industries in terms of job growth, concentration, and competitiveness.
- Labor force participation is higher than the State rate but lower than the nation. Decreasing participation rates are a long-term national trend; however, the COVID-19 pandemic exacerbated the trend, and rates have not yet recovered to pre-pandemic levels.
- Unemployment is at its lowest since at least 2017.
- Over 28% of the population is overqualified for the types of jobs employers are offering, which is higher than at the State and national levels.
- Enrollments and completions are declining; the vast majority of completions are for college degrees and over 40% are completed through distance learning.
- The top common skills point to strengths in customer service and management, while specialized skills indicate workforce strengths in white collar jobs.
- The Region is a net importer of labor; most commuters remain within the State for work and have a relatively short commute time.
- The age of the workforce is increasing, in keeping with State and national trends.
- The Region's workforce is less diverse than the State or nation but has made gains over the past 5 years, especially among Hispanic or Latino workers.
- The sex composition of the workforce is stable and consistent with broader trends.
- There are 8 underserved populations with higher jobless rates than the overall workforce. They could potentially be activated within the workforce given the right support and circumstances. The vast majority of these individuals are not currently participating in the workforce (as opposed to unemployed).
- The underserved populations that have the highest jobless rates include older workers (who may or may not be retired), teens, and individuals with disabilities. The underserved populations that would have the greatest impact in terms of expanding the workforce include individuals with disabilities, Black or African Americans, and females below the poverty line.

Demographics

Population
1.1 M

- 5.6% of the State's population
- According to the latest Census Bureau County Vintage estimates, the region's population grew by 2%.
- The region's population trajectory is in keeping with state trends.

Median Age
37.9 – 48.5

Range across region

- With a range of 10.6 years, **median age varies widely across the Region** (lowest: Albany County; highest: Columbia County)
- 7 of the 8 counties are older than the State (39.0) and the nation (38.2)
- **Fewer millennials than expected** for an area this size (206,446 compared to 222,248)
- **Higher retirement risk than expected** for an area this size (364,315 compared to 320,987)

Diversity
19.6%

BIPOC Share of Population

- **Increased by 18,102 over the last 5 years** (+1.8% compared to +1.3% for the State and +1.9% for the US)
- **Racial diversity is lower than expected** for an area this size (208,285 racially diverse people compared to 434,398)

Educational Attainment
36.9%

Bachelor's Degree +

- **0.9% lower than the State attainment rate of 37.7%, but 3.7% above the national attainment rate of 33.2%**
- **The high school graduation rate is 89.6%** (+6.0% increase since 2011), which is slightly higher than the State's rate (88.0%) *
- **The high school drop out rate is 7.2%** (-2.4% decrease since 2011), which is lower than the State's rate (8.0%) *

* 6-year outcomes, NY State Education Department

Household Income
$56,681 - $85,224

Range across region

- With a range of $28,543, **median household income varies widely across the Region** (lowest: Greene; highest: Saratoga County)
- 2 of the 8 counties have higher household incomes than the State ($71,117) while 5 are higher than the nation ($64,994)
- Poverty rate ranges from 3.4% (Saratoga County) to 8.9% (Greene County), but all have **less poverty than the State (10.0%) and the nation (9.1%)**

Average Net Migration
-1,498

2016 - 2020

- The Region is a **net exporter of population** with an average of 23,664 migrating into the region while 25,144 migrating out per year
- In 2020, **50% of in-migration originated within the State, while 30% of out-migration remained within the State**
- In 2020, top originating counties included: Kings County, NY (6%), New York County, NY (6%), Queens County, NY (5%)
- In 2020, top destination counties included: Montgomery County, NY (3%), Fulton County, NY (2%), Kings County, NY (2%)

Economy

Jobs
540,347

- 5.5% of the State's jobs
- **Decreased by -27,880 over the last 5 years** (-4.9% compared to -3.2% in the State and +1.8% in the nation), largely due to the COVID-19 epidemic
- **Projected to grow by +13,122 over the next 5 years** (+2.4% compared to +3.0% in the State and +4.3% in the nation)
- **47%** of the jobs lost in the past 5 years are projected to be recovered by 2026

Average Earnings
$80,899

- $20,219 **below the State average** of $101,118 (which is likely heavily skewed by New York City residents) and $3,100 **above the national average** earnings of $77,799
- **Grew by 27% since 2016** (average growth of 24% across all industries)

Gross Regional Product
$87.3 B

- 4.7% of the State's GRP, which is low relative to the Region's share of the State's population (5.6%) and jobs (5.5%)
- **Increased by 0.5% over the last 5 years***
- **Productivity is at $161,592 per worker**, which is $27,738 lower than the State, but $22,473 higher than the nation

*US BEA

Competitiveness
-34,984

*jobs added or lost due to local factors **

- Residential Intellectual and Developmental Disability Facilities: +1,424
- Casino Hotels: +1,144
- Biological Product (except Diagnostic) Manufacturing: +1,144
- Wired Telecommunications Carriers: +605
- Computer Systems Design Services: +586

* i.e. job growth or decline cannot be explained by national or industry growth

High Concentration* Industries

- Synthetic Rubber Manufacturing: 26.4
- Biological Product (except Diagnostic) Manufacturing: 22.4
- Turbine and Turbine Generator Set Units Manufacturing: 20.35
- Paper (except Newsprint) Mills: 12.9
- Ground or Treated Mineral and Earth Manufacturing: 11.7

* Compares an industry's share of regional employment with its share at the national level. A LQ of 2.5 would mean the industry is 2.5x more concentrated in the region than the typical region.

High Growth Industries
2016 - 2021

- General Warehousing and Storage: +1,588 jobs (57% growth)
- Biological Product (except Diagnostic) Manufacturing: +1,571 (108%)
- Residential Intellectual and Developmental Disability Facilities: +1,173 (30%)
- Casino Hotels: +1,135 (2842%)
- Computer Systems Design Services: +1,007 (36%)

Labor Force

Labor Force
559,234

June 2022

- 5.9% of the State's labor force
- **Labor force participation rate* of 61.8%,** which is 1.7% **higher than the State** (60.1%), but 0.7% **lower than the nation** (62.5%)
- **Declining participation is a long-term trend; rates have not yet recovered to the pre-pandemic rate of 63.2%** (2019)
- **345,372 not participating in the labor force**, which accounts for 5.4% of the State's total (53.3% are 65+)

* Includes the civilian, noninstitutional population 16+

Unemployment
2.9%

June 2022

- **16,494 workers are unemployed**, which accounts for 3.9% of the State's total
- Unemployment is 1.5% **lower than the State** (4.4%) and 0.9% **lower than the nation** (3.8%)
- **Unemployment rates are at their lowest since at least 2017**
- 47.0% of the unemployed are between the ages of 25 and 44, while **26.3%** are BIPOC

Underemployment *
28.4%

- Underemployment is 3.1% **higher than the State** (25.3%) and 2.2% **higher than the nation** (26.2%)
- **There are 7.2% more people with Some College, Non-Degree Awards than required by employers; 10.2% more with an Associate's Degree; and 11.0% more with a Graduate Degree or Higher**

* Underemployment = Population at Educational Level – Jobs Requiring Educational Level

Average Annual Degree Completions
26,137

2016 - 2020

- 24 higher education institutions operating within the Region
- **95,294 enrollments in 2020** (a 21.2% decrease since 2016)
- 25,475 completions in 2020 (-3.5%)
- **41.8% of completions in 2020 were in distance programs** (+5.5%)
- 88.9% of completions were for degrees; 22,635 degrees were awarded in 2020 (-3.8%)
- **11.1% of completions were for certificates**; 2,840 certificates were awarded in 2020 (-1.0%)

Top Skills
*Based on profile analytics **

2016 - 2021

Specialized:

- Marketing (7%)
- Strategic Planning (6%)
- Event Planning (4%)
- Project Management (3%)
- Sales Management (3%)

Common:

- Customer Service (18%)
- Management (14%)
- Sales (13%)
- Microsoft Office (11%)
- Leadership (11%)

* Profile analytics mine data from the 492,152 online resumes that list the Region as the place of residence (90.2% of all jobs in the Region).

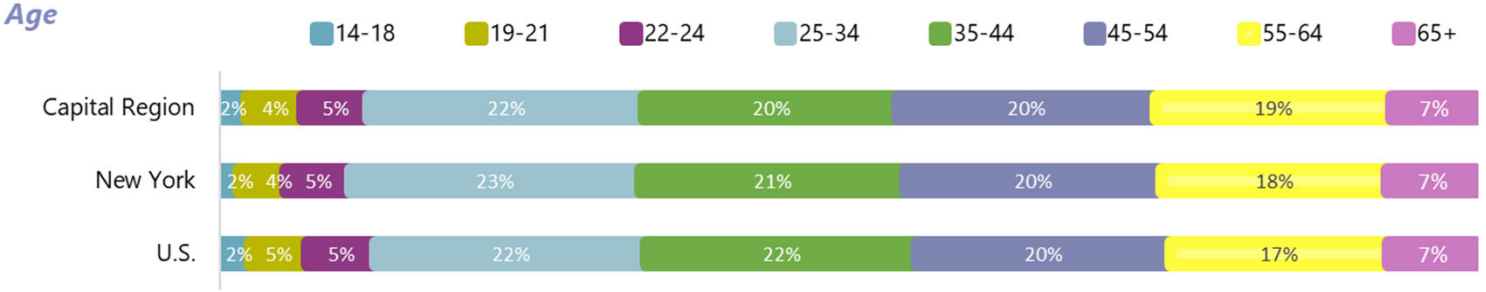
Net Commuters
+10,871

- **The Region is a net importer of workers** with 82,242 inbound commuters (10% from out of state) and 71,371 outbound commuters (11% head out of state)
- Top origins: Montgomery County, NY (8%), Fulton County, NY (6%), Suffolk County, NY (5%)
- Top destinations: New York County, NY (12%), Dutchess County, NY (7%), and Onondaga County, NY (6%)
- Mean commute time ranges from 20.8 minutes (Albany County) to 28.7 minutes (Greene County); 7 of 8 counties have quicker commutes than the nation (26.9 min) and all 8 are quicker than the State average (33.5 min)

Labor Force Demographics

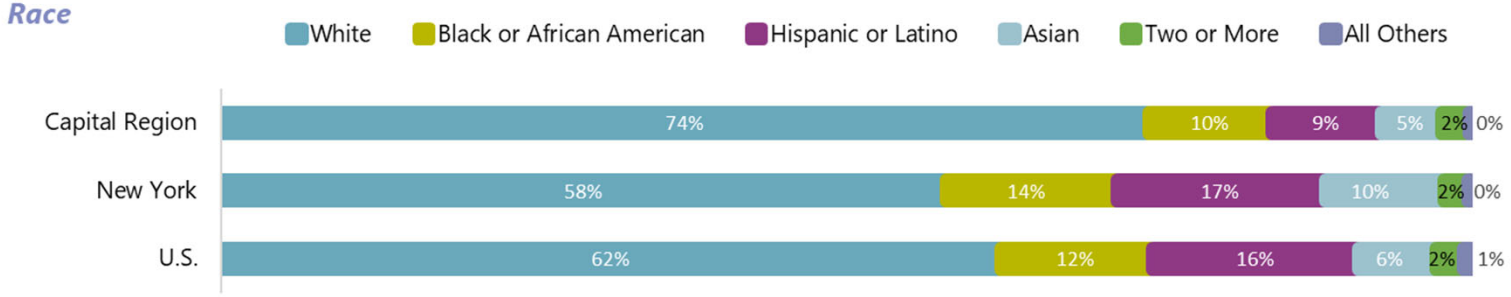
The graphs below show the demographic distribution of the Capital Region's workforce by age, race, and sex.

Age



The age of the Capital Region's workforce closely mirrors the age distribution at the State and national level, with 12% youth and young adults (ages 14 – 24), 63% prime working age adults (25 – 54), and 26% nearing retirement (55 and older). Over the past 5 years, the workforce has gotten slightly older, aligning with State trends and outpacing national aging trends.

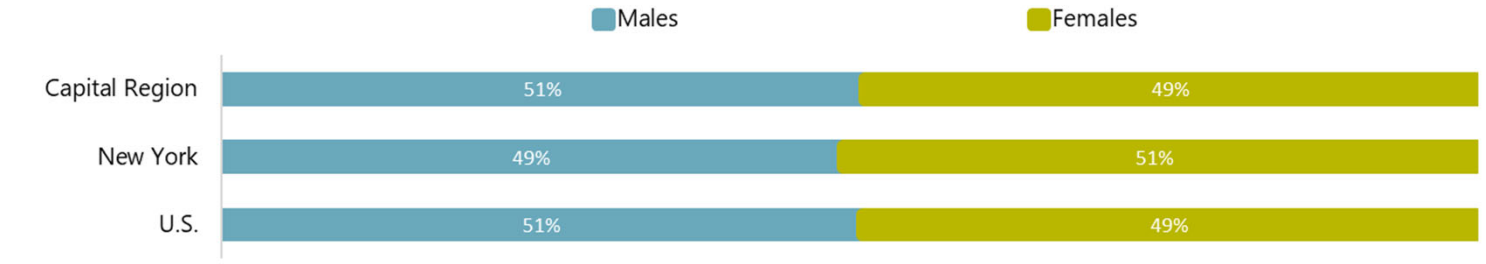
Race



"All Others" includes American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander

The racial composition of the Capital Region's workforce is significantly less diverse than the State or the nation, with only 26% BIPOC workers compared to 42% for the State and 38% for the nation. However, the Region's workforce is diversifying at a slightly faster pace, with a 2.6% increase in BIPOC workers in the past 5 years compared to 1.8% for the State and 2.3% for the nation. The largest gains were in Hispanic or Latino workers (1.2% increase since 2016).

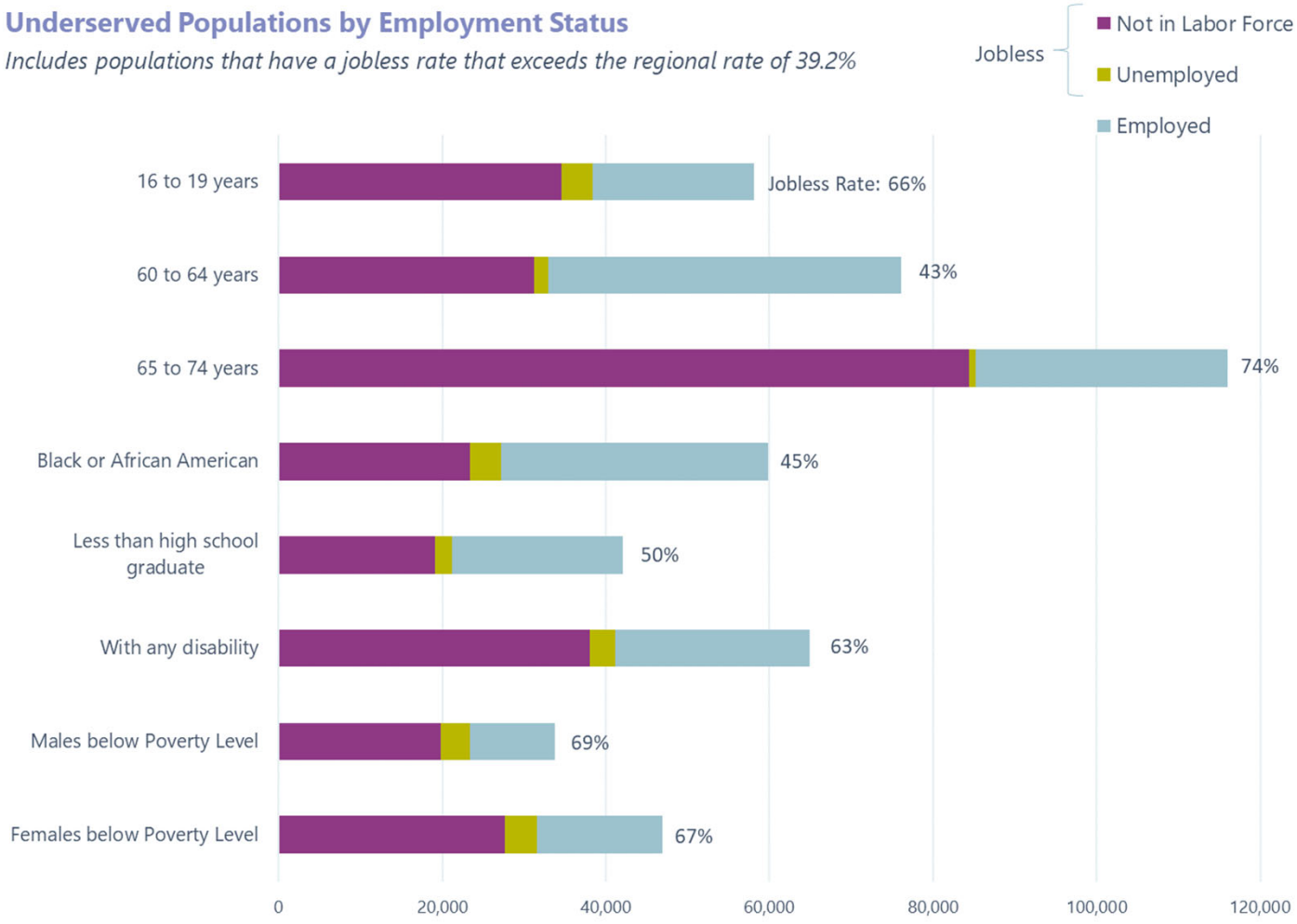
Sex



The Capital Region's workforce aligns with the sex distribution at the national level but has slightly fewer males than the State. The sex distribution of workers has remained fairly consistent over the past 5 years for all 3 regions of analysis.

Underserved Populations

The graph below shows the underserved populations that have a jobless rate that exceeds that of the Region as a whole. Jobless workers – which includes both the unemployed and those who are not currently seeking employment – represent an opportunity to expand the workforce both in terms of additional workers and in terms of inclusivity and equity. There are 8 underserved populations with higher jobless rates than the overall workforce. They **could potentially be activated within the workforce** given the right support and circumstances (a person could fall within multiple categories, e.g. aged 65-74 and Hispanic or Latino). Of these, 92% are not in the labor force and 8% are unemployed. The underserved populations that have the highest jobless rates include older workers (who may or may not be retired), individuals below the poverty line, teens, and individuals with disabilities. **The underserved populations that would have the greatest impact in terms of expanding the workforce include older workers and individuals with disabilities.** Populations whose jobless rates are lower than the overall regional rates include: all other age groups, all other educational attainment categories, veterans, and formerly incarcerated individuals.



Source: American Community Survey, 5 Year Estimates, 2020; Jobless = Not in Labor Force + Unemployed

Appendix: B

Top Gap Occupation Data

Top Gap Occupations

	Inspectors, Testers, Sorters, Samplers, and Weighers 51-9061	Software Developers 15-1252	Industrial Engineers 17-2112	Packaging and Filling Machine Operators and Tenders 51-9111	General and Operations Managers 11-1021	Miscellaneous Assemblers and Fabricators 51-2098	Biological Technicians 19-4021	First-Line Supervisors of Production and Operating Workers 51-1011	Chemists 19-2031
Cluster Jobs	358	389	464	242	443	407	292	267	240
Share of Staffing Pattern	2.6%	2.8%	3.4%	1.8%	3.2%	3.0%	2.1%	1.9%	1.7%
2021 Net Commuters	70	14	171	-54	104	82	34	86	31
Change in Resident Workers (2016 - 2021)	4%	23%	10%	-11%	25%	-33%	-3%	0%	6%
2021 Turnover Rate	53%	27%	25%	42%	42%	64%	41%	36%	23%
Automation Index (1)	106	80	92	117	82	113	90	89	87
Earnings									
Avg. Hourly Earnings	$25.20	$49.91	$48.49	$18.64	$56.25	$17.51	$24.89	$36.04	$42.83
Wage Difference from Self Sufficiency (2)									
1 adult	$13.78	$38.49	$37.07	$7.22	$44.83	$6.09	$13.47	$24.62	$31.41
1 adult + 1 school aged child	$6.73	$31.44	$30.02	$0.17	$37.78	($0.96)	$6.42	$17.57	$24.36
Workforce Gap Analysis (2022-2032)									
Openings (3)	470	445	438	444	430	424	424	339	317
Labor Force Change (4)	(14)	(16)	(19)	(12)	(17)	(13)	(11)	(11)	(10)
Occupational Gap (5)	(484)	(461)	(457)	(455)	(447)	(437)	(435)	(350)	(327)
Average Annual Gap	(48)	(46)	(46)	(46)	(45)	(44)	(43)	(35)	(33)
Share of Total Gap	3.1%	3.0%	2.9%	2.9%	2.9%	2.8%	2.8%	2.2%	2.1%
Job Requirements									
Typical entry-level education	HS diploma or equiv.	Bachelor's degree	Bachelor's degree	HS diploma or equiv.	Bachelor's degree	HS diploma or equiv.	Bachelor's degree	HS diploma or equiv.	Bachelor's degree
Typical Work Experience	None	None	None	None	5 years +	None	None	< 5 years	None
Typical on-the-job training	Moderate	None	None	Moderate	None	Moderate	None	None	None
Training Pipeline									
Higher Education Training Programs	3	53	10	0	111	0	25	7	14
Avg. Annual Completions (2010 - 2020) (6)	15	539	103	0	4,508	0	356	27	159
Apprenticeship Programs (7)	.	.	.	.	.	.	.	.	.
Other Training Programs (8)	.	1	.	.	.	.	.	.	.
Certification Offered	.	.	.	.	.	.	.	.	.
Demographics									
Age < 25	7%	5%	4%	11%	2%	10%	17%	2%	5%
Age 55 +	27%	15%	25%	19%	27%	25%	15%	28%	21%
Females	37%	19%	18%	51%	28%	36%	43%	17%	37%
Diversity	37%	34%	17%	41%	12%	28%	28%	17%	26%

Notes

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5) **Occupational Gap** = Labor Force Change – Openings
6) **Average Annual Completions:** Assumes the Northeast's graduate retention rate of 71%. Source: National Center for Education Statistics.
7) **Apprenticeship Programs:** Source: US Department of Labor's National Registered Apprenticeship System
8) **Other Training Programs:** Source: New York State Eligible Training Providers List

Top Gap Occupations

	Software Developers 15-1252	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel 41-3091	Customer Service Representatives 43-4051	General and Operations Managers 11-1021	Computer Systems Analysts 15-1211
Cluster Jobs	1,828	948	677	878	1,026
Share of Staffing Pattern	6.7%	3.5%	2.5%	3.2%	3.7%
2021 Net Commuters	14	179	751	104	357
Change in Resident Workers (2016–2021)	23%	18%	1%	25%	-20%
2021 Turnover Rate	27%	63%	61%	42%	29%
Automation Index (1)	80	97	96	82	82
Earnings					
Avg. Hourly Earnings	$49.91	$35.22	$19.75	$56.25	$42.20
Wage Difference from Self Sufficiency (2)					
1 adult	$38.49	$23.80	$8.33	$44.83	$30.78
1 adult + 1 school aged child	$31.44	$16.75	$1.28	$37.78	$23.73
Workforce Gap Analysis (2022–2032)					
Openings (3)	2,175	1,216	870	851	802
Labor Force Change (4)	(79)	(36)	(24)	(34)	(39)
Occupational Gap (5)	(2,255)	(1,252)	(894)	(885)	(841)
Average Annual Gap	(225)	(125)	(89)	(88)	(84)
Share of Total Gap	7.7%	4.3%	3.0%	3.0%	2.9%
Job Requirements					
Typical entry-level education	Bachelor's degree	HS diploma or equiv.	HS diploma or equiv.	Bachelor's degree	Bachelor's degree
Typical Work Experience	None	None	None	5 years +	None
Typical on-the-job training	None	Moderate	Short	None	None
Training Pipeline					
Higher Education Training Programs	53	15	46	111	57
Avg. Annual Completions (2010–2020) (6)	38	11	33	79	40
Apprenticeship Programs (7)	1	.	.	.	.
Other Training Programs (8)	1	.	.	.	.
Certification Offered	1	.	.	.	.
Demographics					
Age < 25	5%	8%	13%	2%	5%
Age 55 +	15%	25%	21%	27%	21%
Females	19%	32%	68%	28%	35%
Diversity	34%	15%	27%	12%	30%

Top Gap Occupations, continued

	Telecommunications Line Installers and Repairers 49-9052	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers 51-2028	Computer User Support Specialists 15-1232	Computer Programmers 15-1251	Project Management Specialists 13-1082
Cluster Jobs	515	373	692	927	683
Share of Staffing Pattern	1.9%	1.4%	2.5%	3.4%	2.5%
2021 Net Commuters	94	-8	54	204	108
Change in Resident Workers (2016–2021)	-21%	31%	-5%	-19%	133%
2021 Turnover Rate	46%	25%	29%	36%	33%
Automation Index (1)	117	111	83	83	87
Earnings					
Avg. Hourly Earnings	$35.03	$18.93	$27.39	$39.68	$49.32
Wage Difference from Self Sufficiency (2)					
1 adult	$23.61	$7.51	$15.97	$28.26	$37.90
1 adult + 1 school aged child	$16.56	$0.46	$8.92	$21.21	$30.85
Workforce Gap Analysis (2022–2032)					
Openings (3)	668	669	629	589	576
Labor Force Change (4)	(20)	(17)	(28)	(31)	(26)
Occupational Gap (5)	(687)	(686)	(657)	(620)	(602)
Average Annual Gap	(69)	(69)	(66)	(62)	(60)
Share of Total Gap	2.3%	2.3%	2.2%	2.1%	2.0%
Job Requirements					
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	Some college, no degree	Bachelor's degree	Bachelor's degree
Typical Work Experience	None	None	None	None	None
Typical on-the-job training	Long	Moderate	Moderate	None	None
Training Pipeline					
Higher Education Training Programs	3	8	86	48	128
Avg. Annual Completions (2010–2020) (6)	2	6	61	34	91
Apprenticeship Programs (7)	.	.	1	1	.
Other Training Programs (8)	.	.	.	2	.
Certification Offered	.	.	.	1	.
Demographics					
Age < 25	6%	8%	9%	6%	3%
Age 55 +	16%	27%	18%	21%	25%
Females	5%	37%	25%	21%	37%
Diversity	21%	35%	28%	25%	19%

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5) **Occupational Gap** = Labor Force Change – Openings
6) **Average Annual Completions:** Assumes the Northeast's graduate retention rate of 71%. Source: National Center for Education Statistics.
7) **Apprenticeship Programs:** Source: US Department of Labor's National Registered Apprenticeship System
8) **Other Training Programs:** Source: New York State Eligible Training Providers List

Top Gap Occupations

	Electricians 47-2111	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers 51-2028	General and Operations Managers 11-1021	Software Developers 15-1252	Electrical and Electronic Engineering Technologists and Technicians 17-3023	Industrial Engineers 17-2112
Cluster Jobs	1,542	481	710	501	505	583
Share of Staffing Pattern	6.7%	2.1%	3.1%	2.2%	2.2%	2.6%
2021 Net Commuters	86	-8	104	14	116	171
Change in Resident Workers (2016–2021)	-5%	31%	25%	23%	44%	10%
2021 Turnover Rate	54%	25%	42%	27%	31%	25%
Automation Index (1)	110	111	82	80	99	92
Earnings						
Avg. Hourly Earnings	$33.86	$18.93	$56.25	$49.91	$30.76	$48.49
Wage Difference from Self Sufficiency (2)						
1 adult	$22.48	$7.55	$44.88	$38.54	$19.38	$37.11
1 adult + 1 school aged child	$15.47	$0.54	$37.86	$31.52	$12.37	$30.10
Workforce Gap Analysis (2022–2032)						
Openings (3)	1,685	867	657	547	510	505
Labor Force Change (4)	(54)	(22)	(26)	(20)	(18)	(22)
Occupational Gap (5)	(1,739)	(889)	(683)	(567)	(528)	(527)
Average Annual Gap	(174)	(89)	(68)	(57)	(53)	(53)
Share of Total Gap	7.4%	3.8%	2.9%	2.4%	2.2%	2.2%
Job Requirements						
Typical entry-level education	HS diploma or equiv.	HS diploma or equiv.	Bachelor's degree	Bachelor's degree	Associate's degree	Bachelor's degree
Typical Work Experience	None	None	5 years +	None	None	None
Typical on-the-job training	Apprenticeship	Moderate	None	None	None	None
Training Pipeline						
Higher Education Training Programs	4	8	111	53	17	10
Avg. Annual Completions (2010–2020) (6)	3	6	79	38	12	7
Apprenticeship Programs (7)	13	1	.	.	.	.
Other Training Programs (8)	3	.	.	.	.	.
Certification Offered	3	.	.	.	.	.
Demographics						
Age < 25	8%	8%	2%	5%	6%	4%
Age 55 +	22%	27%	27%	15%	29%	25%
Females	2%	37%	28%	19%	13%	18%
Diversity	14%	35%	12%	34%	23%	17%

Top Gap Occupations

	Electrical Engineers 17-2071	Semiconductor Processing Technicians 51-9141	Mechanical Engineers 17-2141	Project Management Specialists 13-1082	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive 43-6014	Civil Engineers 17-2051
Cluster Jobs	548	310	635	522	420	523
Share of Staffing Pattern	2.4%	1.4%	2.8%	2.3%	1.8%	2.3%
2021 Net Commuters	67	31	135	108	410	120
Change in Resident Workers (2016–2021)	-35%	32%	-2%	133%	-7%	15%
2021 Turnover Rate	20%	21%	26%	33%	54%	21%
Automation Index (1)	85	108	83	87	91	82
Earnings						
Avg. Hourly Earnings	$52.86	$22.43	$50.74	$49.32	$21.14	$46.17
Wage Difference from Self Sufficiency (2)						
1 adult	$41.49	$11.06	$39.37	$37.95	$9.76	$34.79
1 adult + 1 school aged child	$34.47	$4.04	$32.35	$30.93	$2.75	$27.78
Workforce Gap Analysis (2022–2032)						
Openings (3)	446	442	419	415	419	410
Labor Force Change (4)	(21)	(12)	(22)	(18)	(14)	(19)
Occupational Gap (5)	(467)	(455)	(441)	(433)	(433)	(428)
Average Annual Gap	(47)	(45)	(44)	(43)	(43)	(43)
Share of Total Gap	2.0%	1.9%	1.9%	1.8%	1.8%	1.8%
Job Requirements						
Typical entry-level education	Bachelor's degree	HS diploma or equiv.	Bachelor's degree	Bachelor's degree	HS diploma or equiv.	Bachelor's degree
Typical Work Experience	None	None	None	None	None	None
Typical on-the-job training	None	Moderate	None	None	Short	None
Training Pipeline						
Higher Education Training Programs	11	1	10	128	35	6
Avg. Annual Completions (2010–2020) (6)	8	1	7	91	25	4
Apprenticeship Programs (7)	.	.	.	.	.	.
Other Training Programs (8)	.	.	.	.	.	.
Certification Offered	.	.	.	.	.	.
Demographics						
Age < 25	4%	7%	5%	3%	7%	5%
Age 55 +	28%	12%	24%	25%	36%	29%
Females	7%	22%	7%	37%	95%	11%
Diversity	22%	30%	16%	19%	20%	24%

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