



Virginia Coalfield Economic Development Authority Target Industry Strategic Analysis Report

Virginia Tech Center for Economic and Community Engagement
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Introduction

The Virginia Coalfield Economic Development Authority partnered with the Virginia Tech Center for Economic and Community Engagement (VTCECE) to conduct a target industry strategic analysis. More specifically, VTCECE sought to offer VCEDA a data-driven approach to validating the relevance of its existing industry targets – either to external markets or among internal stakeholders and investors in the organization- and organize and prioritize VCEDA’s efforts to promote job growth and investment within its geographic footprint. VTCECE began work in February of 2022, our approach included the following steps:

- First, VTCECE collected and analyzed publicly-available and proprietary secondary data to better understand the region’s current economic makeup and direction in the organization’s footprint (Buchanan, Dickenson, Lee, Russell, Scott, Tazewell, Wise counties, and the City of Norton). VTCECE worked with VCEDA to identify criteria against which to assess and narrow existing, emerging and potential sectors and industries.
- Next, VTCECE used quantitative and qualitative data to develop an asset inventory and SWOT analysis of the region relative to the key analytical criteria for target industries. This included reviewing recent reports containing industry sector stakeholder feedback; partners, supply chain employers and prominent industry leaders’ feedback from previous relevant plans to help glean experiences, assets, and strengths in the region.
- VTCECE conducted a national demand analysis to contextualize findings with opportunities and challenges unique to the VCEDA region. VTCECE consulted previous research to identify which clusters are complementary to the region’s economic growth and direction, as well as the unique features and resources captured in the region and its surroundings.

Information gleaned from this process was later synthesized into a comprehensive final report that is reflective of key findings, which were used to clearly identify recommended target industry sectors and list existing regional assets of importance to those sectors. Finally, target strategies and best practices for VCEDA to adopt, continue, or consider were crafted.

Regional Overview

The VCEDA region covers seven counties and one city: Buchanan County, Dickenson County, Lee County, Russell County, Scott County, Tazewell County, Wise County, and the City of Norton. In 2021, the population was 186,992, declining by 4.7% since 2016 - a trend not uncommon to Southwest Virginia and Appalachian communities. The population is expected to continue to decline by 3.2% by 2026. As of March 2022, the unemployment rate for the region was 3.5%, a 2.0% since 2017.

The labor force participation rate in March, 2022 was 48.21%, lower than the state's rate of 63.57% and the nation's rate of 62.23%. The largest proportion of workers is between the ages of 45-64 at 47.7% and workers between the ages of 24-44 make up the second highest proportion at 40.4%. The anticipated pipeline of workers based on 2021 graduates shows that 37% of graduates were planning to continue their education by attending a two-year college, while 29% were planning on attending a four-year college. The number of students expected to start employment after graduating was 25%.

The highest level of education attained by the majority of the region's population is a high school diploma, with 35.1% achieving their diploma or equivalent. In 2021, the region had 1,428 students complete CTE programs, receiving training that will prepare them to enter the workforce. The region has a lower proportion of degree holding adults, with 30.6% completing some college or an associate degree, but only 9.1% completing a bachelor's degree. Mountain Empire Community College and Southwest Virginia Community College have the highest number of completions in the region with awards of less than one year and associate degrees. A high school graduate makes on average \$26,454, while on average those with a bachelor's degree make \$43,395.

The VCEDA region has 29 available sites and industrial parks, all varying in size and shovel-ready status. The availability of possible industrial and research parks is beneficial to draw prospective businesses to the region.

Methodology and Approach

CECE collected quantitative and qualitative data, employing a mixed methods approach to develop evidence-based target sector recommendations based on a thorough understanding of regional assets and opportunities reflecting national industry trends.

The CECE team worked with VCEDA staff, local economic development directors, local government managers, chambers of commerce, industry leaders and existing business owners to collect data to develop an asset map and SWOT analysis of the region relative to the key analytical criteria for target industries. CECE also gathered secondary data for the VCEDA region and localities including economic, industry and workforce trends, as well as industrial park, available building and parcel data. The Appendix of this report provides selected regional secondary economic and industry data.

Virginia Tech refined the SWOT analysis through a demand analysis based on national industry trends documented in secondary data, including practitioner-oriented site selection media. The data helped assess suitability between established and emerging industries and the assets and opportunities present in the region.

At the outset, we worked with VCEDA staff to identify a set of criteria against which to assess potential target industry sectors. The overall purpose of the analysis is to aid the organization in developing a more targeted comprehensive strategy to attract and retain world-class jobs, investment and talent in the Virginia Coalfield region. To that end, potential industry sectors were assessed against the following criteria:



Figure 1: Eight Goals for Targeting Criteria

Existing, emerging and potential sectors and industries were measured against these criteria. In addition to the secondary industry data, stakeholders, such as local government, business, and industry representatives, provided valuable qualitative data through interviews conversations. The VCEDA staff provided input at multiple stages of the process.

Figure 2 provides an illustrative explanation of how CECE studied a number of sectors, but not ultimately recommended for targeting activities, based on the assessment criteria.

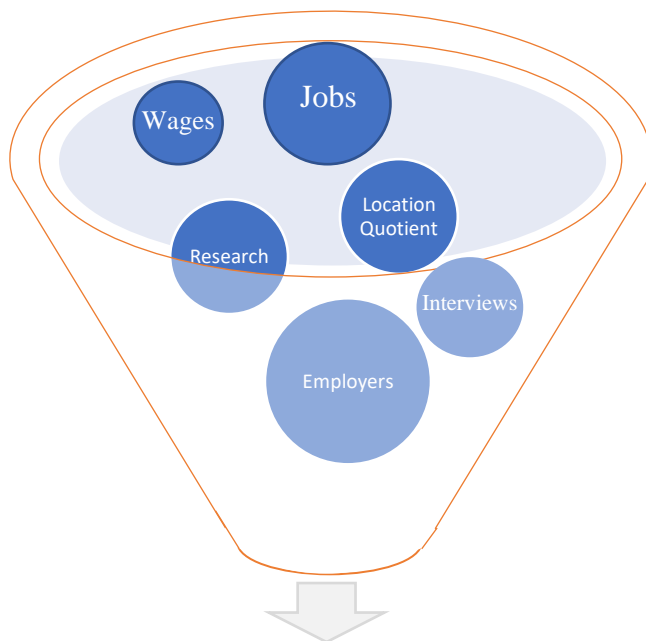


Figure 2: Qualitative and quantitative data funnel

Some of the sectors considered, but not selected, included: healthcare; education and knowledge, construction and building; lodging, warehousing, and transportation; and finance and corporate management. VCEDA should consider some of the sectors excluded at this time for future re-assessment. Most of the sectors not selected were lacking in some of the key assessment criteria such as assets alignment, potential for regional industry diversification, or projected growth trajectory.

The report recommends four primary target industry sectors: **advanced manufacturing; electronic information technology; energy related enterprises; and creative tourism**. Within each sector, this report identifies several specific sub-sectors of interest. This report includes separate sections more fully describing each of these sectors and sub-sectors, and includes overview descriptions, examples of existing companies, justifications for sector targeting, targeting challenges, and sector-specific opportunities.

Target Sector: Advanced Manufacturing

Advanced manufacturing refers to both new ways of manufacturing existing products and the fabrication of entirely new products emerging from advanced technologies. The industry sector typically offers competitive wages, contributes to a region's gross regional product, and offers career pathways for workers with a wide variety of education and skills, including many middle-skill jobs.¹ Over the past decade, advanced manufacturing has become an increasingly automated and data-intensive sector with record production levels.²

Global economic conditions also appear more favorable to the future of American manufacturing than they have in recent decades. The resurgence in manufacturing has been catalyzed by the strengthening economy, workforce quality, tax policies, the regulatory environment, and transportation and energy costs. For instance, the cost competitiveness of U.S. manufacturing in comparison to competitor nations has improved, and when indirect costs are considered, it is less costly for companies to produce many goods domestically for American consumers.³ In the selected manufacturing subsectors, the Virginia Coalfield Economic Development Authority (VCEDA) region has 99 establishments with over 2,781 workers, nearly a 9% increase over the last five years.⁴ During that same period, manufacturing employment in Virginia decreased by 3%, and the nation's decreased by 2%. For illustrative purposes, two competitor regions, the Virginia Growth Alliance Region and High Country Region, North Carolina, experienced a decrease of 10% and an increase of 9%, respectively.

Based on recent job growth, industry presence, and related criteria, recommended manufacturing target sectors are: Machinery, Fabricated Metal, Wood Product and Furniture Related Manufacturing, and Electrical Equipment.

1. Machinery Manufacturing

Companies in this area manufacture transportation equipment such as mining machinery and parts, machine tools, and other machine parts. As of 2021, there are at least 26 establishments in the VCEDA region offering more than 793 jobs, 126% greater than the national average for employment.⁵ From 2017-2021, the VCEDA region experienced a 23% increase in jobs in this sector compared to a 3% national decrease and a 0% change in Virginia. Some of the companies of this industry sector operating in the VCEDA region include:

¹ EMSI (2015 October). Defining Advanced Manufacturing at the Industry Level and Pinpointing Its Growing Hubs. Retrieved from: <http://www.economicmodeling.com/2015/10/02/defining-advanced-manufacturing-at-the-industry-level-and-pinpointing-its-growing-hubs/>

²International Association of Automation (April, 2022). Manufacturing Technology Orders Highest in Two Decades for First Two Months of 2022 . Emerging Global Trends in Advanced Manufacturing.

³ Brookings (July 2018). Global manufacturing scorecard: How the US compares to 18 other nations. Retrieved from: <https://www.brookings.edu/research/global-manufacturing-scorecard-how-the-us-compares-to-18-other-nations/>

⁴ EMSI data based primarily on the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor

⁵ Emsi data based primarily on the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA).

- **Tadano Mantis Corporation**, manufactures telescopic boom crawler cranes ranging in size from 30 to 130 tons
- **Simmons Equipment Company**, mining equipment manufacturer who is leading the charge in developing safer, more productive machines for today's miner
- **Komatsu**, manufacturer of construction, mining, forestry, and industrial equipment

2. Fabricated Metal Manufacturing

This sector includes companies making primary and fabricated metal products, developing new processes and tools to support advanced materials. Fabricated metals impact and support innovations across a variety of industries. In the VCEDA region, there are at least 16 companies employing over 682 workers, a number 99% greater than the national average for employment.⁶ Over the last 5 years, VCEDA employment in this sector has increased by 8%, more than the national loss of 4% and more than the state decrease of 2%. The average earnings per job are \$50,307. While some positions do require an advanced degree, the largest number of industry workers are machinists and molding, coremaking and casting machine setters, operators, and tenders. These positions usually require some post-secondary training, but not necessarily a two or four-year degree. Some examples of firms in these industries in the VCEDA region include:

- **Samuel Pressure Vessel Group**, design, manufacture and distribute pressure vessel solutions
- **Lawrence Brothers Inc.**, heavy metal fabricator specializing in battery tray fabrication and other related steel manufacturing
- **NorrisBuilt Fabrication**, fabrication, welding and machine shop

3. Wood Product and Furniture Related Manufacturing

Companies in this sector manufacture wood products such as lumber, plywood, wood containers, and more. Additionally, companies also use processes such as cutting, molding, and assembly of wood, metal, glass, plastics, and rattan to make furniture and related products including mattresses, window blinds, cabinets, and fixtures. As of 2021, the VCEDA region has 54 establishments offering more than 1,254 jobs, 108% more than the national average for employment. VCEDA employment has seen significant growth (207%) in the past 5 years, mainly due to the increase of jobs in the Cut Stock, Resawing Lumber, and Planing industry (96%). Average earnings for a job in Wood Product and Furniture Related Manufacturing is \$44,756. Some of the companies in this industry sector operating in the VCEDA region include:

- **Tempur Sealy**, develops, manufactures and markets mattresses, adjustable bases, pillows and other sleep and relaxation products
- **England Furniture**, manufacturer of upholstered furniture
- **Mullican Flooring**, hardwood flooring manufacturer

⁶ Emsi data based primarily on the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA).

4. Electrical Equipment Manufacturing

The companies in this sector manufacture component parts or electronic products, such as computers or parts, testing equipment, and communications-related devices and parts. As of 2021, the VCEDA region has at least 3 establishments offering more than 52 jobs. The average earnings per job are high for the region, at \$60,550. Some of the companies in this industry sector operating in the VCEDA region include:

- **PBE Group**, a global provider of power equipment, communication services, data and safety solutions
- **AMR Pemco**, offers a diverse line of electronic monitoring, atmospheric monitoring, wireless communications, underground tracking, and electrical products for mining, tunneling, oil & gas, aggregates, power generation, utilities, and many other industrial operations around the world

Justifications

- These advanced manufacturing sectors have **high average wages for the region**, a **diversity of employment opportunities** in terms of education and skill requirements, and are either **experiencing growth or have a higher concentration of firms or establishments than the nation as a whole**, and some peer regions.
- In combination, VCEDA employment in these four manufacturing sectors increased by 54 jobs (2%) from 2017-2021, **more than the national rate** of -2%. The industries are **projected to increase** by 89 jobs (3%) in the VCEDA region from 2021 - 2026, differing from the national growth rate of 2%.
- Manufacturing has the **greatest economic multiplier of any sector**, and some estimates suggest that 8 additional jobs are created for every 1 new manufacturing job.⁷
- The region possesses many of the features important to advanced manufacturing site selectors including **adequate transportation and utility infrastructure**, and a **skilled available workforce**.
- Global and national trends suggest near-term opportunities in manufacturing attraction. In 2021, the U.S. was on track to add 224,213 jobs from abroad, with reshoring making up 62% of increases in manufacturing jobs.⁸ **Manufacturing is forecast to increase faster than the general economy** due to more exports; U.S. manufacturing production is the largest globally, responsible for producing 18.2% of the world's products, while China produces 17.6%.⁹

⁷ Economic Policy Institute (2019, January). Updated employment multipliers for the U.S. economy. Accessible at: <https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/>

⁸ Secard, R. (2021, Sept.) Reshoring on Track to Hit Record Highs in 2021. *IndustryWeek*, Accessible at <https://www.industryweek.com/talent/article/21175936/reshoring-on-track-to-hit-record-highs-in-2021-initiative-says>

⁹ Terra Staffing Group. (2020, Mar.) U.S. Manufacturing Growth & Outlook in 2021. *Terra Staffing Group*. Accessible at <https://www.terrastaffinggroup.com/resources/blog/us-manufacturing-growth/>

- In 2021, Skyline Fabricating Inc., a metal fabrication company which specializes in structural steel construction, announced its expansion in Buchanan Company to account for the increased demand in steel and aluminum fabricated projects. **The project will create 22 new jobs related to fabricated metals manufacturing, contributing to the growth of this sub-sector.**¹⁰
- In a 2021 survey, **78% of manufacturers had a more positive outlook for 2022 than they did in 2021**, now being better equipped post-pandemic. This confidence is due to 57% of respondents increasing their sales and revenues in 2021, with 78% believing that in 2022 sales and revenue will increase even more.¹¹
- Advanced manufacturing companies **connect very well with the strengths of the higher education institutions and existing and emerging research assets in the region**. Organizations such as GENEDGE assist in accomplishing this by partnering with employers, research, and education.
- Southwest Virginia Community College (SWCC) and Mountain Empire Community College (MECC) offers **a number of training and education opportunities in support of the VCEDA manufacturing sector**.¹² In addition to ongoing offerings, SWCC and MECC will work with area employers to tailor training to specific company needs. For instance, companies will provide particular materials or equipment to SWCC and MECC so that current or future workers can have experience with that during training.
- The VCEDA region has some existing supply of moderate to small sites and spaces suitable for advanced manufacturing (12 available locations), as well as one Tier 4 level site and one Tier 3 level location.¹³
- Metal and machinery manufacturing in the VCEDA region is distinguished by the presence of companies such as Lawrence Brothers Inc. and Tadano Mantis Corporation.
- Tempur Sealy, located in Scott County, is one of the largest manufacturing employers in the region with 600 workers. In 2021, the Duffield facility used a \$100,000 VCEDA grant awarded to the Scott County Economic Development Authority for workforce development and training needs to support the expansion, and the 25 jobs that will be added within 2 years.

¹⁰ VEDP. (2021, Nov.) Steel Fabrication Company to Expand in Buchanan County. Retrieved from <https://www.vedp.org/press-release/2021-11/skyline-fabricating-buchanan-county>

¹¹ Usery, A. (2022, Jan.) 2022 Business Outlook for Manufacturing. *LBMC*. Accessible at <https://www.lbmc.com/blog/business-trends-manufacturing/>

¹² Southwest Virginia ESEM Community Advisory Plan. 2022.

¹³ VCEDA. Retrieved from <https://www.vceda.us/sites-buildings-search/>

- The region has **good highway accessibility, and access to major markets**, two factors listed as prominent site location factors according to the Virginia Business Ready Sites Program (VBRSP).¹⁴

Challenges

- While the region has a number of sites, **product quality varies, and larger shovel-ready sites are a challenge**. The region's largest ready-to-go site is under 100 acres, smaller than desired by larger manufacturing prospects. Specifically looking at Southwest, currently, only five sites over 100 acres were identified for investment by Virginia Build Ready Sites Program¹⁵
- Many existing sites and structures in the region are not ideal fits for typical industry preferences due to the topography, workforce, and proximity to infrastructure such as interstates, major airports, and the Port of Virginia. These challenges, particularly topography, mean that sites will often cost more to develop in Southwest Virginia than in other parts of the state and may take longer to realize project wins.
- Many manufacturing and supply chain projects are lost in the region due to the lack of well-prepared sites or available buildings. Sites are located in distressed communities in smaller metros or rural areas with above-average unemployment or poverty rates, which is a challenge for business attraction.¹⁶
- SWCC, MECC, and other students in training often leave a degree or certificate program prior to earning the credential, often for employment purposes, which may be a short-term sign of robust employment, but could lead to a longer-term gap in the number of workers possessing prospect-desired credentials.
- Some employers report that workers may experience **difficulty accessing affordable and quality childcare**.
- Some **existing employers report difficulties with filling open positions**, often citing skills mismatches (a high number of candidates lacking requirements) or a higher-than-expected number of candidates who fail to pass a drug test, criminal records check, or other screening requirement.¹⁷
- The **VCEDA skills gap in manufacturing mirrors national trends**. The labor market is unable to

¹⁴ VCEDA. Retrieved from <https://www.vceda.us/>

¹⁵ Reenergize Southwest Virginia Report. 2021.

¹⁶ Reenergize Southwest Virginia Report. 2021.

¹⁷ Cumberland Plateau Planning District Commission. 2021. Comprehensive Economic Development Strategic Update Report.

find manual, operational, and highly technical skilled workers with the knowledge, or expertise to take open positions. A 2021 study conducted by Deloitte and the Manufacturing Institute (MI) predicts that 2.1 million manufacturing positions will go unfulfilled by 2030.¹⁸

- Manufacturing companies purchase goods and services to operate. Only 10.1% of these supply chain requirements of existing companies are satisfied within the VCEDA region.¹⁹ This is both a challenge as well as an opportunity for import substitution.

Opportunities

- The region's **relatively low cost of living** compared to national, state and peer regions is an asset for companies and workers.
- Labor and energy costs are the two primary considerations for manufacturing company location decisions globally, and **labor and energy costs in the VCEDA region are highly competitive** in Virginia and nationally.²⁰ The regional earnings per job for companies across all four of these manufacturing sectors was \$66,011 in 2021, which was \$13,918 below the national average of \$79,929.
- In recent years, **advanced manufacturing training and coursework have been established in a number of areas**, and resources and funding (almost \$10 million in federal funds across the NRV and SWVA) are available to support incumbent worker training, as well as the training of future workers. Moreover, existing manufacturers report that they are "able to work with educational institutions to create programs that help our workforce."
- Metals and materials manufacturers are actively pursuing increased innovation, product development, and research (43% of sector respondents reported plans to launch one or more new products).²¹
- Looking at occupations across the four manufacturing target sectors reveals an overall employment concentration of 1.11 times the national job concentration, indicating higher than **average workforce availability**. These occupations are projected to increase (3%) from 2021-2026, indicating the prospective potential for **the regional talent pool to increase**.²²
- The higher education institutions in the VCEDA region have established partnerships with manufacturers in job training as well as research and development. For instance, Mountain

¹⁸Manufacturing.net (August 2021). The Manufacturing Skills Gap: What Is It? Retrieved from: <https://www.manufacturing.net/labor/article/21627393/the-manufacturing-skills-gap-what-is-it#:~:text=Referred%20to%20as%20the%20manufacturing,a%20buzzword%20within%20the%20industry>.

¹⁹Source: Emsi's model, incorporating data from the Bureau of Economic Analysis (BEA).

²⁰2016. The Shifting Economics of Global Manufacturing. BCG Global Manufacturing Cost-Competitiveness Index. Accessible at: <https://www.bcg.com/expertise/capabilities/lean-manufacturing/shifting-economics-global-manufacturing.aspx>

²¹2016. KPMG's Global Manufacturing Outlook 2016. Accessible at

<https://home.kpmg.com/content/dam/kpmg/pdf/2016/05/global-manufacturing-outlook-competing-for-growth.pdf>

²² Source: Emsi's model, incorporating data from the Bureau of Economic Analysis (BEA).

Empire Community College, Southwest Virginia Community College, Virginia Highlands Community College, and Wytheville Community College developed a partnership to expand the training and development to prepare workers to enter the supply chain manufacturing for the offshore wind energy field, **creating a new pathway for those interested in manufacturing.** ²³

- **Cutting-edge innovation centers and organizations** such as The Southwest Virginia Alliance for Manufacturing offer benefits to manufacturing prospects, as well as existing companies.
- Proactively invest in **connecting new and expanding businesses with local educational institutions to develop open courses** providing candidates with needed skills. This may lead to internship and apprenticeship opportunities, as immersive, hands-on opportunities.

²³ 2022. SW community colleges to create wind manufacturing workforce. Accessible at:

Target Sector: Electronic Information Technology

The Electronic Information Technology sector includes companies in telecommunications, internet publishing, data hosting, and software and computer systems design.²⁴ Overall, the region has at least 109 establishments employing nearly 3,235 workers. While the concentration of electronic technology workers is higher than the national average, the number of workers in the VCEDA region has increased by 1% since 2017, while the nation (2%) and the state (3%) had slightly larger increases. Moreover, two illustrative peer regions, High Country, NC and One East, KY have experienced employment increases in this sector of 2% and a decrease of 3% respectively. Overall, the electronic technology sector offers a range of occupations and overall high average earnings. The presence of multiple neighboring higher education institutions offering programs and graduates in various technology related subjects is a regional advantage. Based on recent job growth, industry presence, and related criteria, recommended electronic technology sub-sectors are: Software Development, Telecommunications and Data Centers, and IT Support Services.

1. Software Development

This sector includes companies that design computer programs while maintaining them, documenting, testing, as well as fixing bugs that are involved with these products. In the VCEDA region, software development has increased by 2% over the past five years.²⁵ The average earnings in the VCEDA region is \$47,788 per year.²⁶ The entry-level education required for this sub-sector is a bachelor's degree in computer science, software engineering, mathematics, or a related field that is applicable to the profession.²⁷ Some of the companies operating in this sub-sector in the VCEDA region include:

- **CGI**, also known as CGI Global is an information technology consulting and systems integration company
- **Atomicorp**, a comprehensive workload protection platform that ensures security and compliance in any cloud, datacenter, or hybrid environment
- **Arsenal Development**, a technology consulting service specializing in data analytics and software development

²⁴ For this sector, we included 13 4-digit NAICS code categories. See full report for more detail.

²⁵ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

²⁶ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

²⁷ Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Software Developers, on the Internet at <https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>

2. Telecommunications and Data Centers

This sector includes telemarketing and communication services, data processing and hosting, and telecommunication carriers. In the VCEDA region, telecommunications and data centers have increased by 7% over the past five years.²⁸ The average earnings in the VCEDA region is \$46,722 per year.²⁹ The typical entry-level requirements for these occupations are postsecondary education in electronics, telecommunications, or computer sciences/networking, while some may require a bachelor's degree.³⁰ Some of the companies operating in the VCEDA region include:

- **DP Facilities**, *designs and builds critical data centers, and provides colocation, custom design/build services, and disaster recovery solutions*
- **OnePartner**, *a technology and healthcare transformation company which specializes in providing consulting and data solution services to global companies*
- **Issues & Answers**, *an independent global marketing research firm providing scalable research services*

3. IT Support Services

This sector includes companies that assist customers with a variety of technology products including software products, computers, mobile phones, and other electronic/mechanical goods. IT support services has decreased 8% over the past five years.³¹ The median pay for this sector is \$55,141 per year.³² Education requirements for this field vary. Some jobs require a degree in a major with computer knowledge; however, that is not always necessarily a postsecondary degree. There are certifications to validate employee knowledge and teach best practices of IT support services. Some of the companies operating in this sub-sector in the VCEDA region include:

- **Sitel Group**, *contact center company that provides outsourced sales, technical support, customer service, and other business processes for large companies*
- **AT&T Wireless**, *telecommunications company that provides wireless services in the United States*
- **Crutchfield Corporation**, *company specializing in a wide range of electronics, including mobile audio and video equipment for the automobile, along with speakers, televisions, and other electronics for home or portable use.*

²⁸ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

²⁹ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

³⁰ Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-2017 Edition, on the Internet at <https://www.bls.gov/ooh/management/computer-and-information-systems-managers.htm#tab-4>

³¹ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

³² Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Computer Support Specialists, on the Internet at <https://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm>

Justifications

- The information technology sector **aligns well with Virginia strengths**. Nearly 9% of Virginia's workforce are IT workers, representing the third-highest concentration of technology workers in the U.S. according to Cyberstates 2022. As much as 70% of the world's internet traffic passes through Virginia.³³
- In combination, VCEDA employment in these three sectors increased by 75 jobs (2%) from 2017-2021, **more than the national rate** of -2%. The industries are **projected to increase** by 329 jobs (10%) in the VCEDA region from 2021 - 2026, differing from the national growth rate of 6%.³⁴
- Forecasters expect **continued industry-wide growth in information technology**. Global IT industry revenues are on pace to exceed \$5.3 trillion in 2022, returning to 5-6% annual growth after the pandemic.³⁵ The U.S. market represents 33 percent of the worldwide total, or slightly over \$1.8 trillion, and is the largest tech market in the world.
- **IT sector employment growth is outpacing national total employment growth by two to one, with many occupations growing at 4-5 times the national rate.**³⁶ U.S. tech sector employment is estimated to total 8.9 million in 2022, an increase of 178,000 workers from 2021. Tech industry employment is estimated to make up 5.7% of the total workforce.³⁷
- **Office space lease costs are much lower in the VCEDA region than in tech sector urban hubs.** Cost concerns are increasingly a concern for IT companies nationally. For instance, average annual office lease rate per square foot in Wise is between \$6-\$15, which is much lower than northern Virginia (\$35.92), Charlotte (\$33.17), Baltimore (\$25.86) and Raleigh-Durham (\$29.96).³⁸
- The **strength of the higher education and community institutions generate a talented workforce and supportive ecosystem**. Southwest Virginia Community College, Mountain Empire Community College, and the University of Virginia's College at Wise each have degree programs directly related to the tech sector.

³³ From https://www.cyberstates.org/pdf/CompTIA_Cyberstates_2022.pdf

³⁴ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

³⁵ IDC, From: <https://connect.comptia.org/content/research/it-industry-trends-analysis>

³⁶ IDC, From <https://connect.comptia.org/content/research/it-industry-trends-analysis>

³⁷ From <https://www.cyberstates.org/#keyfindings>

³⁸ 2021. JLL Industry Trends for Q4 2021. <https://www.us.jll.com/content/dam/jll-com/documents/pdf/research/americas/us/jll-q4-2021-us-office-outlook.pdf>

- Some other VCEDA region entities that support the IT sector include CGI's Southwest Virginia Technology Center, which **employs over 375 software developers, analysts, and consultants in its facility in Russell County**. The Center also supports local outreach and education programs with the area's public schools.³⁹
- **Broadband access is available in many areas in the VCEDA region as a regional strength**. In 2021, the region received over \$45 million in broadband grants to install more connections across the counties, further strengthening this asset for the region.⁴⁰
- In 2021, EarthLink, LLC an internet service provider company, was announced in Wise County and the City of Norton. **The company stated it chose Wise due to the existing infrastructure and skilled workforce, expecting to bring 285 full time jobs** for its call center.⁴¹
- There are a number of sites throughout the VCEDA region that are compatible with IT company site selection criteria. Leading IT employers such as CGI, AT&T, and Verizon are based in the VCEDA region. Available sites include Lonesome Pine Regional Business & Technology Park and Scott County Regional Business & Technology Park, which are **both located near university and business resources and are lower cost sites than others in dominant tech cities**.
- The Appalachian Council for Innovation **provides networking opportunities and connections to resources related to IT across the region**. Business owners are easily able to connect with one another, attend technology-related events, and access co-working spaces with other virtual workers in the industry.⁴²
- The Oxbow Center of UVA Wise is a coworking space that entrepreneurs can book to collaborate with other business owners who are specifically working in the technology industry. Entrepreneurs can pay for hourly, daily, or monthly room rates, as well as conference rooms for larger meetings. **Spaces such as the Oxbow Center are beneficial for entrepreneurs who can innovate with others in the same industry, gain professional support, and connect to other business owners in the region**.⁴³
- SWCC offers a number of information technology degree and non-degree programs. SWCC has

2021. CGI's Southwest Virginia Data Center. Accessible at: <https://www.prnewswire.com/news-releases/cgis-southwest-virginia-it-delivery-center-celebrates-15-years-of-continued-service-economic-impact-and-commitment-to-the-commonwealth-of-virginia-301241450.html>

⁴⁰ 2021. Southwest Virginia leaders react to universal broadband funding. Accessible at: <https://www.wjhl.com/news/local/southwest-virginia-leaders-react-to-universal-broadband-funding/>

⁴¹ EarthLink, LLC. Retrieved from: <http://www.balisenissanriparts.com/index-38.html>

⁴² Appalachian Council for Innovation. Retrieved from <https://inappalachia.com/appalachian-council-for-innovation/>

⁴³ Oxbow Center. Retrieved from <https://www.oxbowcenter.com/>

- built partnerships with companies in several different IT-related industries and has incorporated IT associates degree-track programs in Software Engineering and Information Systems Technology, and **ten career studies certificate programs at their STEM Center** which include Computer Repair Technician, Cybersecurity, Network Administration, and a Google IT Support Professional Certificate, among others.⁴⁴
- Mountain Empire Community College offers 13 career pathway certificate programs related to technology careers, including Software Development, Computer Networking Technology, and Unmanned Aircraft Systems. With their Cybersecurity Career Studies Program, **MECC is accredited as a National Center of Academic Excellence in Cyber Defense.**⁴⁵
 - **UVA Wise offers the only four-year, undergraduate degree program in Virginia for software engineering.** Students are able to gain experience while working at various paid internships while completing their degree.⁴⁶
 - **Area high schools and CTE programs are increasingly introducing students to IT careers and providing IT-related skills development.** Cybersecurity Career Pathway CTE courses are offered, and students may enroll in one of four pathways: Programming and Software Development, Health and Medical Sciences, STEM/Pre-Engineering Technology, and Network Systems.⁴⁷
 - SWVA United Way developed the IGNITE Internship Program, which **provides high school students a four-week summer internship opportunity** where they can gain experience and connect to employers. Students can hold positions such as IT Technical Assistant Intern, Information Technology Intern, and Technology Assistant Intern, preparing a pipeline of youth for work in the IT industry.⁴⁸

⁴⁴ Retrieved from <https://sw.edu/engineering-and-technology-path/>

⁴⁵ Retrieved from <https://www.mecc.edu/?pathway-types=technology>

⁴⁶ Retrieved from <https://www.uvawise.edu/academics/majors-minors/software-engineering#:~:text=Accredited%20by%20the%20Engineering%20Accreditation,a%20plethora%20of%20paid%20internships.>

⁴⁷ VDOE. Cybersecurity. Accessible at: https://www.doe.virginia.gov/instruction/career_technical/cybersecurity/index.shtml

⁴⁸ SWVA United Way. Retrieved from <https://www.unitedwayswva.org/our-work/youth-success/initiatives/ignite-internships>

Challenges

- Nationally, IT workforce challenges include: finding workers with expertise in emerging tech fields; competing with other tech firms for talent; finding workers with the right soft skills; rising salary expectations; and insufficient pool of talent in region/ locale.⁴⁹
- **Retention of younger single professionals in the region, as they progress in their careers has also been reported to be an issue**, reportedly associated with the relatively lower numbers of post-collegesingle professionals, in their 20s and 30s, the associated scarcity of social amenities and networking for that demographic, as well as the relatively limited number of middle-management technology occupations.⁵⁰
- Site availability and characteristics, such as the Karst topography that limits the inventory of land suitable for data centers, may be a limitation for attracting some prospects in this sector.
- **The IT sector is rapidly changing and volatile- firms form, grow, and die fairly quickly and only a small fraction of companies achieve highest growth rates.** Multiple studies found that 90% of venture-backed startups fail, if their result is less than a 10X investor return on capital over ten years.⁵¹
- Although broadband access in the VCEDA region has increasingly improved, **there are still areas lacking infrastructure, making it difficult for small business owners, remote workers, and others to have that last mile broadband access.** Survey results show that the majority of the Pound River region in Dickenson County “is devoid of anything that could be considered a reliable internet connection.”⁵²

⁴⁹ 2022. US adds tech jobs, new businesses in the face of pandemic challenges. Retrieved from: <https://www.prnewswire.com/news-releases/us-adds-tech-jobs-new-businesses-in-the-face-of-pandemic-challenges-comptia-state-of-the-tech-workforce-report-reveals-301512601.html>

⁵⁰ Reenergize Southwest Virginia Report. 2021.

⁵¹ Nano Globals (June 2021). Is It True That 90% of Startups Fail? Retrieved from: <https://nanoglobals.com/startup-failure-rate-myths-origin/>

⁵² Thompson & Litton. Comprehensive Broadband Assessment of Dickenson County. Provided by VCEDA.

Opportunities

- Industry **forecasters are most optimistic about near-term U.S. growth potential** in IT services, cloud computing, and cybersecurity.⁵³
- Nationally, more than 98 percent of IT companies are small and medium-sized firms (under 500 employees) and the vast majority (93.0%) are “microfirms”, of fewer than 50 employees.⁵⁴
- The VCEDA region supportive network for IT is strong for a region of this type and size. Some research suggests that a larger and more diverse “founding team” for a technology-based company equates with greater likelihood of company growth.⁵⁵ The larger companies such as The Sitel Group and CGI can provide small and emerging firms with access to advice on business strategy, management and protection of intellectual property. Without that assistance, information technology start-ups and smaller firms may fail to grow and succeed.
- In terms of growth, IT companies may vary in terms of their orientation to growth. For instance, high-growth oriented companies require higher levels of capital and support than may be accessible in the VCEDA region, but companies with a slower growth orientation, or with a desire to remain smaller and more nimble may find the region well-suited in terms of labor availability, networks, and other factors.
- Relatedly, **the VCEDA region may be particularly well-suited for targeting satellite offices, R&D units, or back-office support entities associated with larger IT companies.** The Sitel Group and OnePartner are existing examples of this type of location.
- In addition to back-office or research unit operations of larger companies, **smaller early-stage firms in more saturated and expensive urban markets may also represent an attraction opportunity.** One 2019 industry forecast noted that early-stage firms may be priced out of established tech hubs due to costs factors, making smaller markets more appealing, particularly those with talent pools.⁵⁶
- The VCEDA region has a number of small towns that have experienced modest growth and

⁵³ CompTIA, 2021 IT Industry Report. Accessible at: https://comptiacdn.azureedge.net/webcontent/docs/default-source/research-reports/report---2021-comptia-it-industry-outlook.pdf?sfvrsn=18f99ffd_0#:~:text=Moving%20forward%2C%20IDC%20projects%20that,on%20prior%20to%20the%20pandemic.

⁵⁴ U.S. Census. 2019 SUSB Annual Data Tables by Establishment Industry. Retrieved at: <https://www.census.gov/data/tables/2019/econ/susb/2019-susb-annual.html>

⁵⁵ 2009. EU Community Research and Development Information Service. Innovation Papers No. 32.

⁵⁶Tech Crunch (November 2019). Where tech companies should look to expand. Retrieved from: <https://techcrunch.com/2019/11/04/where-tech-companies-should-look-to-expand/>

reinvestment and contain walkable, compact downtown spaces. Feedback from at least one existing IT employer suggests that these communities are increasingly the type that are appealing to smaller IT companies and their workers. **Research corroborates this trend as companies increasingly seek walkable neighborhoods; easy transportation accessibility; clean and safe environments; appealing and interesting downtown buildings for office space; and a welcoming community.**⁵⁷

- Companies associated with emerging potential growth areas such as Unmanned Systems and Robotics are also present in the region. The higher education institutions in the VCEDA region and surrounding area offer degrees in fields such as physics, engineering, and unmanned systems that include Engineering Design Technology and Architectural & Engineering Design Specialization. **These emerging industries may offer additional opportunities for IT workers that are specialized in software development with unique application to Unmanned Systems and Robotics.**

⁵⁷Smart Growth America (June 2015). Core Values: Why American Companies Are Moving Downtown. Retrieved from: <https://smartgrowthamerica.org/resources/core-values-why-american-companies-are-moving-downtown/>

Target Sector: Energy Related Enterprises

The VCEDA region has a history in coal mining and oil and gas operations. In the 1970s, over 5,000 people in Buchanan County alone worked in the mining industry, and the county's population itself peaked at more than 35,000 people living there.⁵⁸ However, as demand for coal has shifted over time, the local industry has been required to shift as well. Metallurgical coal used for steel making is still heavily exported from the region, but the recent transition to other energy sources impacts these historically prominent industries in the region. Southwest Virginia is the fourth most impacted coal community nationwide, and overall, the state of Virginia had peaked in 1990 with coal production, experiencing a 70% decrease since then.⁵⁹ Due to these changes, renewable energy sources are an emerging industry in the area, as coal-related mining is beginning to transition to more sustainable, cleaner solutions. There is an overlap between where fossil fuel jobs are now and where alternative energy generation and production could be, making the development into this industry attainable for the region.

Along with renewable energy, an emerging industry in the VCEDA region is battery storage. With the Virginia Clean Economy Act (VCEA), Virginia now has the largest target for energy storage deployments in the United States.⁶⁰ In the VCEDA region, this is achieved through the Energy Storage and Electrification Manufacturing project (ESEM), which uses the experience in heavy industrial applications in underground mining operations to expand into new markets. The previous regional assets in manufacturing and mining can be transferred into in-demand energy occupations, which provide workers with specialized experience and high pay with lower formal education requirements. The huge innovation potential and cost competitiveness of renewable energy and energy storage can hold economic promise for rural regions.⁶¹

In 2021, the VCEDA region had 1,382 jobs in this industry, with average earnings of \$75,287. The region is expecting a 1% increase in employment in the next five years, while the nation is expecting a 2% increase.⁶² Existing strengths in this industry are: Renewable Energy and Manufacturing and Battery Storage and Manufacturing.

⁵⁸ Porter, Eduardo. (2019, Dec.) Can a Coal Town Reinvent Itself? *The New York Times*. Retrieved from <https://www.nytimes.com/2019/12/06/business/economy/coal-future-virginia.html>

⁵⁹ Reenergize Southwest Virginia Report. 2021.

⁶⁰ Virginia Energy Storage Task Force. (2021, Oct.) Final Report. Retrieved from <https://www.scc.virginia.gov/getattachment/7414bf55-7570-4b3a-bd55-cddc9812e976/Va-Energy-Storage-Task-Force-Rept.pdf>

⁶¹ Retrieved from: <https://www.brookings.edu/research/how-renewable-energy-jobs-can-uplift-fossil-fuel-communities-and-remake-climate-politics/>

⁶² EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

1. Renewable Energy and Manufacturing

This industry group is comprised of establishments primarily engaged in generating, transmitting, and/or distributing renewable energy, such as solar, wind, biomass, or other forms. Businesses may perform one or more of the following activities: operate generation facilities that produce renewable energy; construct the structures necessary for alternative energy, including water systems and solar panel installations; and engineering services that are required to operate electric power distribution systems. In the VCEDA region, there are at least 85 companies employing over 1,140 workers. Over the last 5 years, VCEDA employment in this sector has decreased by 1%, less than the national increase of 6% and the state increase of 7%. The average earnings per job are high at \$87,516.⁶³ Some examples of firms in these industries in the VCEDA region include:

- **Dominion Energy**, a producer and distributor of energy focused on providing electricity, natural gas and related services to customers.
- **Sun Tribe Solar**, clean energy company specializing in semiconductor manufacturing
- **Savion**, delivers utility-scale solar and energy storage project development

2. Battery Storage and Manufacturing

This sector includes companies that primarily engage in manufacturing technologies such as pumped hydro storage, lithium-ion batteries, power generation and distribution, and other of electrochemical-mechanical storage types. Energy storage is defined as “any technology that is capable of absorbing energy, storing that energy for a period of time, and re-delivering that energy after storage.”⁶⁴ In the VCEDA region, there are at least 6 companies employing over 242 workers, a number 88% greater than the national average for employment. In the next five years, employment is expecting a 9% growth in the region, more than the 4% national growth and 5% growth expected for the state.⁶⁵ The average earnings per job are high at \$63,058. Some examples of firms in these industries in the VCEDA region include:

- **Lawrence Brothers Inc.**, a manufacturer of battery storage trays and other components
- **AMR Pemco**, which manufactures electrical switchgear, transformers, and components
- **Dominion Energy**, which has announced plans to explore the development of pumped hydro storage in the region

⁶³ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

⁶⁴ Virginia Energy Storage Task Force. (2021, Oct.) Final Report. Retrieved from <https://www.scc.virginia.gov/getattachment/7414bf55-7570-4b3a-bd55-cddc9812e976/Va-Energy-Storage-Task-Force-Rept.pdf>

⁶⁵ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

Justifications

- The VCEDA region has **an abundant workforce available**; almost 40% of those unemployed are between ages 25 to 44, meaning jobs in these emerging industries could be a beneficial opportunity for those workers.⁶⁶
- **Existing skillsets of workers that previously worked in mining-related or manufacturing-related occupations are transferrable to various operations in this industry**, limiting challenges of transitioning into this field.
- **Wages in this industry are among the highest in the region** (\$75,287), making these occupations highly desirable for workers.
- Dominion Energy is exploring **projects related to wind, solar, and hydroelectric “pump storage” in Tazewell County**, which is an innovative way to store renewable energy. The pumped storage facility would complement the Bath County Pumped Storage Station, described as the “largest battery in the world.”⁶⁷
- Access to **Virginia Tech’s world class mechanical engineering program, which offers specializations in energy engineering and sciences** can create a pipeline of highly trained workers to available opportunities in the region, keeping skilled workers in the region post-graduation as well.
- The Solar Workforce Accelerator will be a joint solar education program between SWCC and MECC. Funded through a grant from the VCEDA Renewable Energy Fund, the goal of this program is **to create a pipeline for solar workforce training through the dual-track solar credentialing and internship program at the two colleges**. Students will be placed into paid internships at solar installations in the VCEDA region.⁶⁸
- Research has been initiated surrounding **the opportunities in rare earth minerals and other uses of carbon**. Their uses are important as electronics and renewable energy technologies have become increasingly important, as mineable reserves for rare earth minerals are valuable and strategic as the alternative energy sector grows.⁶⁹
- The VCEDA region has a **redundant and robust electrical grid**, which is beneficial for

⁶⁶ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

⁶⁷ 2020. Power companies partner up: AEP working on energy advancements for West Virginia. Accessible at: https://www.bdtonline.com/news/power-companies-partner-up-dominion-aep-working-on-energy-advancements-for-west-virginia/article_e7c4ef26-11a3-11eb-b66c-0b22d2c34237.html

⁶⁸ 2021. VCEDA Annual Report. Accessible at: <https://rga.lis.virginia.gov/Published/2022/RD160/PDF>

⁶⁹ 2021. Rare Earth elements: Where in the world are they? Accessible at: <https://www.visualcapitalist.com/rare-earth-elements-where-in-the-world-are-they/>

implementing multiple sources of energy in a region that would depend on a strong power source. Power outages cost excessive amounts of money; by having a reliable electrical grid, less energy and dollars would be wasted. With enhanced and efficient technology, problems can be resolved quickly, and data can be tracked on the time it takes to connect renewable energy sources to the electric grid and what the current level of greenhouse gas emissions are.⁷⁰

- **The Solar Workgroup of SWVA** is a collaborative organization focused on developing the solar industry in the region. With a focus on advancing workforce development and entrepreneurship to increase local solar projects, the significance of this industry will grow.
- The usage of batteries for energy storage has **cheaper production costs and greater capacity than other energy storage technologies** and is also cleaner than traditional plants. It is expected that these costs will only further decrease by between 50-66% by 2030.⁷¹
- **The Energy Storage and Electrification Manufacturing Project (ESEM)** provides technical assistance and capital access expertise to support manufacturers as they look to enter energy-related markets. Research is also being conducted on four ESEM pilot project companies located in the VCEDA region to not only improve the project, but address needs to improve the industry's outlook moving forward.⁷²
- Regulatory agencies in Virginia such as the Department of Mines, Minerals, and Energy are supportive of alternative energy and new uses of reclaimed and abandoned mine land. **DMME has recently changed its name to Virginia Energy to further reflect the changing landscape of the region and their support for energy initiatives.**
- There are **at least 22 existing abandoned mines in the VCEDA region**. Many are inactive and have yet to be reclaimed. These mineral resources could be reclaimed and revitalized for alternative uses, creating an innovative opportunity to these previously abandoned sites.⁷³

⁷⁰ Environmental Defense Fund. Accessible at: <https://www.edf.org/energy/modern-power-grid-can-deliver-cleaner-energy>

⁷¹ 2021. White and Case. Accessible at: <https://www.whitecase.com/publications/insight/construction-arbitration/opportunities-challenges-battery-storage>

⁷² Reenergize Southwest Virginia Report. 2021.

⁷³ 2022. Virginia Energy Mineral Mining. Accessible at: <https://energy.virginia.gov/webmaps/MineralMining/>

- **There is an abundance of reclaimed land for development purposes;** for example, one of the largest solar farms in the Appalachian region is now being built on a former surface mine site in Buchanan County. Opportunities such as this to transform sites for renewable energy purposes are plenty in the region.⁷⁴
- **The growing potential of creating carbon-based products from wood pellets and wood products** emphasizes the growth of alternative energies. Wood-based bioenergy is often compared favorably to fossil fuels due to its relatively smaller carbon footprint. Wood sources may account for greater portions of energy in the future, especially in regions with established wood production and manufacturing.⁷⁵

Challenges

- **The transition from coal-related industries is a challenge.** In 2018, coal accounted for just 16% of total domestic energy production, less than half its share a decade earlier.⁷⁶ This shows that the coal industry is declining, but transitioning to other sources may result in pushback.
- **Shifting away from coal affects suppliers, small community businesses, schools, local governments, etc.** A careful look at three illustrative counties shows that coal-related revenue may fund a third or more of county budgets. The exposure is compounded because school districts and other special districts within the counties also receive coal-dependent revenue.⁷⁷
- Solar and wind power use has grown at a rapid rate over the past decade or so, but as of 2018 those sources accounted for less than 4% of all the energy used in the U.S.⁷⁸ **There is a lack of profitable business model for much of solar, wind and alternate sources of energy.**
- Like many SWVA communities, **the VCEDA region is experiencing an aging workforce;** there are 14,564 more people aged 55+ than the national average. Many of these workers are in manufacturing or mining related occupations, so transitioning new workers into renewable energy industries may require additional training and certifications to be adequately prepared for these roles.⁷⁹

⁷⁴ 2021. (Solar) Powering the Economy. Accessible at: <https://www.virginiabusiness.com/article/solar-powering-the-economy/>

⁷⁵ United States Department of Agriculture. Accessible at: <https://www.fs.usda.gov/ccrc/topics/carbon-benefits-wood-based-products-and-energy>

⁷⁶ Brookings (January 2019). The U.S. Coal Sector. Retrieved from: <https://www.brookings.edu/research/the-u-s-coal-sector/>

⁷⁷ Brookings (July 2019). The risk of fiscal collapse in coal-reliant communities. Retrieved from: <https://www.brookings.edu/research/the-risk-of-fiscal-collapse-in-coal-reliant-communities/>

⁷⁸ Pew Research Center (January 2020). Renewable energy is growing fast in the U.S., but fossil fuels still dominate. Retrieved by: <https://www.pewresearch.org/fact-tank/2020/01/15/renewable-energy-is-growing-fast-in-the-u-s-but-fossil-fuels-still-dominate/>

⁷⁹ Reenergize Southwest Virginia Report. 2021.

- **Graduates are outwardly migrating or considering relocation.** Retaining workers post-graduation to meet the growing demand in these industries will be a concern for the local workforce.⁸⁰
- Although the VCEDA region is enhancing its ecosystem via Opportunity SWVA, it demonstrates a **limited deal flow for new traded sector startups and lacks “critical mass” despite emerging activities and identified opportunities.**⁸¹

Opportunities

- **Expand existing solar energy programs to ensure maximum participation in the clean energy transition.** In recent years, the General Assembly has passed numerous pieces of legislation designed to accelerate the clean energy transition. For example, the shared solar program allows customers to “subscribe” to a nearby solar facility and receive proportional credits on their utility bills, lowering their costs.⁸²
- **Continue offering domain-specific entrepreneurial services and resources to advance promising early-stage companies in clean energy.**⁸³ VCEDA’s Renewable Energy Fund and Seed Capital fund offers support to energy businesses, currently including Southwest Virginia Energy Consultants, Inc., a new solar energy consulting firm in Tazewell.
- **There are current partnerships with educational institutions and employers in an attempt to diversify industries.** Creative ways are needed to boost enrollment in manufacturing or other training programs, leveraging existing skillsets from training and experienced miners to develop new skills required for the future.⁸⁴
- **Leverage industry expertise in creative ways such as establishing a test mine with resident experts to test new systems/equipment.** Energy Storage and Electrification Manufacturing Jobs Project, four companies with historical ties to the coal mining industry in SWVA are exploring ways to pivot toward supplying the growing renewables industry. In April, Northam announced almost \$500,000 in state grant funds would go to support the effort.⁸⁵

⁸⁰ Reenergize Southwest Virginia Report. 2021.

⁸¹ Teconomy Partners LLC. (December 2018). Regional Entrepreneurship Assessment Project. Retrieved from: <https://www.dhcd.virginia.gov/sites/default/files/Docx/gova/regional-materials/region-1-assessment.pdf>

⁸² Reenergize Southwest Virginia Report. 2021.

⁸³ Teconomy Partners LLC. (December 2018). Regional Entrepreneurship Assessment Project. Retrieved from: <https://www.dhcd.virginia.gov/sites/default/files/Docx/gova/regional-materials/region-1-assessment.pdf>

⁸⁴ Southwest Virginia ESEM Community Advisory Plan. 2022.

⁸⁵ Virginia Mercury (September 2021). Can southwest remake into a renewable energy lab? Retrieved from: <https://www.virginiamercury.com/2021/09/20/can-southwest-virginia-remake-itself-as-a-laboratory-for-renewables/>

- **There is interest in the reuse of available mine land for solar farms or higher altitude areas for wind farms.** For example, The Nature Conservancy and Dominion are collaborating on a plan to build a 50-megawatt solar farm on 1,200 acres of a former surface mine and surrounding properties in Wise and Dickenson counties. A smaller solar project, also on former mine land, broke ground last fall in Wise County. The 3.46-megawatt array on 20 acres of a business park is designed to support a data center located in the park.⁸⁶
- Production of rare earth elements and critical, which serve as key components to several clean energy applications is a prime example of how DOE is supporting regional economic growth and job creation in regions traditionally home to the fossil fuel industry.⁸⁷
- **The VCEDA region and surrounding area is exploring new technology of carbon-based products.** Companies located in Pulaski (MOVA Technologies) and Wise counties (Carbon Research and Development Co.) have seen much success in researching pollution control strategies for industrial emissions.⁸⁸
- **Create an integrated, multi-year energy strategy** with short-term targets for developing clean energy and retiring fossil fuels plants that are no longer in use.

⁸⁶ Cardinal News (April 2022) Is Virginia at a solar crossroads? Retrieved from: <https://cardinalnews.org/2022/04/19/is-virginia-at-a-solar-crossroads/>

⁸⁷ Department of Energy (April 2021). DOE Awards \$19 Million for Initiatives to Produce Rare Earth Elements and Critical Minerals. Retrieved from: <https://www.energy.gov/articles/doe-awards-19-million-initiatives-produce-rare-earth-elements-and-critical-minerals>

⁸⁸ Cardinal News (October 2021). Wise County graphene research company: “We’re ready to go commercial.” Retrieved from: <https://cardinalnews.org/2021/10/14/wise-county-graphene-research-company-were-ready-to-go-commercial/>

Target Sector: Creative Tourism

The creative tourism industry encompasses a variety of businesses related to food services, production, technology and research as well as enterprises that specialize in outdoor recreation. The growth of creative industries has been closely linked with another worldwide trend in economic restructuring in recent years – the growth of culturally driven entrepreneurship. This trend involves not only the provision of art galleries, food markets, and small business supports for the consumption of culture, but also local creative quarters within cities for its production. As occupations within this sector continue to recover post-pandemic, 2022 can expect to see a huge growth in entrepreneurship, especially microbusinesses and start-ups, with pay increases by an average of 3.9%.⁸⁹ The same growth can be seen in the outdoor recreation industry. In 2020, over half of Americans participated in outdoor recreation at least once, the highest participation rate on record. As the COVID-19 pandemic ravaged communities and forced a nationwide shutdown, outdoor spaces became places of refuge to safely socialize, improve physical and mental health, connect with family and recover from screen fatigue.⁹⁰ This presents an opportunity for communities to capitalize on their natural assets to maintain the momentum of peaked interest from visitors and residents, alike. The presence of entrepreneurship, local opportunities for tourism and outdoor recreational marketing, and community-building that occurs in this sector gives the region multiple advantages.⁹¹

In 2021, the VCEDA region had 3,992 jobs in this industry and average earnings of \$29,052. The majority of occupations in this sector have low entry to employment, however, often require a great amount of personal investment and passion for growth. The region has numerous cultural, agricultural, and tourism related enterprises that can be marketed for traded employment or provide an opportunity for employment with higher than average wages. Existing strengths in this industry are: Artisan Restaurants and Traded-Sector Pursuits, Food-Based Agriculture and Research, and Outdoor Recreation.

1. Artisan Restaurants and Traded-Sector Pursuits

Businesses in this sector create cultural products from independent artists and include a variety of traded pursuits including specialty and merchandise retail. Locally owned retail establishments that cook and serve food or businesses that sell their output in competition with businesses outside the region are also included. In 2021, the VCEDA region contained at least 323 companies that employed over 3,992 workers. Over the last 5 years, VCEDA employment in this sector has decreased by 9%, which is slightly more than the national decline of 4% and the state decrease of 6%. The average earnings per job are \$29,052 and most positions do not require a degree.⁹² Over the last 5 years, 43 small businesses related to accommodation and food services received VCEDA seed capital funding, which created at least 131 full-time jobs and 239 part-time jobs.⁹³ Seed capital funding was granted to 49 small businesses in the

⁸⁹ Retrieved from: <https://www.nasdaq.com/articles/the-small-business-economy-is-set-to-soar-in-2022>

⁹⁰ Retrieved from: <https://outdoorindustry.org/wp-content/uploads/2015/03/2021-Outdoor-Participation-Trends-Report.pdf>

⁹¹ Retrieved from: <https://www.arts.gov/sites/default/files/COVID-Outlook-Week-of-1.4.2021-revised.pdf>

⁹² EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

⁹³ 2021. VCEDA Seed Capital Data.

region related to arts, entertainment, recreation, and retail trade, creating at least 99 full-time jobs and 115 part-time jobs. Some examples of firms in these industries in the VCEDA region include:

- **Nash Creamery**, *small-scale farm specializing in small batch premium ice cream and local farm products*
- **Big Stone Gap Pottery Shop**, *paint your own pottery studio*
- **Breads by Marla, LLC**, *small bread business who retails at area farmer's markets and area restaurants to supply their bread needs*

2. Food-Based Agriculture and Research

Companies in food-based agriculture are interested in using an agriculture inputs to create other products for purchase and consumption. Additionally, businesses conducting food-based research have been included to capture the emerging biotechnology pursuits of alter living organisms to make or modify products; improve plants or animals; or develop microorganisms for specific agricultural uses. In 2021, the VCEDA region had at least 20 companies employing over 231 workers. Over the last 5 years, VCEDA employment in this sector has decreased whereas the nation and state have seen significant growth. However, data constraints have led some data in the VCEDA to be unavailable. The average earnings per job are \$36,686 and most positions do not require a degree. Over the last 5 years, 3 small businesses received seed capital funding, which created at least 6 full-time jobs and 8 part-time jobs.⁹⁴ Some examples of firms in these industries in the VCEDA region include:

- **Mann's Farms**, *a local produce farm selling strawberries, tomatoes, peppers, cucumbers, green beans, corn, and a variety of produce*
- **Fat Cat Farm**, *farm of culinary herbs, flowers, vegetables and strawberries – started from seed and grown to various stages for retail sale at local farmers markets and offered at wholesale to local farm and garden stores and health food stores*
- **SolarBiotech**, *manufacturing company that uses biofermentation to make food additive and cosmetic ingredients*

3. Outdoor Recreation

Businesses in this sector highlight the region's outdoor recreation by providing services or selling goods that complement its natural assets. In the VCEDA region, there are at least 17 companies employing over 145 workers. Over the last 5 years, VCEDA employment in this sector has decreased by 2%, compared to the national decrease of 1% and the state decrease of 2%. The average earnings per job are \$27,466.⁹⁵ Outdoor recreation and tourism has become an increased focus for communities emerging from the pandemic. In addition to the data that has been revealed above, it is important to capture the VCEDA region's multiple trails, lakes, parks, scenic drives, and recreation areas that are ripe for development. Some examples of firms in these industries in the VCEDA region include:

⁹⁴ 2021. VCEDA Seed Capital Data.

⁹⁵ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

- **Appalachian Adventures & Outfitters**, *recreation vehicle and activity rental business for local trails and tracks*
- **Stone Mountain Adventures**, *tour and guided adventure business and activity rental business for local trails and tracks*

Justifications

- Ample supply of labor with only a few exceptions to include difficulties in finding experienced labor and state opposition. **The VCEDA region contains 78,339 individuals who are within the employable population, neither employed nor unemployed and are not seeking work for whatever reason.**⁹⁶
- **Higher education programs that support increased productivity and efficiency in agriculture practices.** For example, the Smart Farming program at Mountain Empire Community College supports the improvement of the region's agriculture productivity by introducing agricultural producers to IoT technologies, such as drones and remote sensors, and by training students to better understand the environmental factors that influence plant growth and soil fertility.⁹⁷ SWCC also has agricultural programs, including an Agricultural Business program which is aimed to better prepare workers for technological advances and teaches skills such as accounting, economics, and marketing for future business owners.⁹⁸
- The Virginia Department of Agriculture and Consumer Services reported that more than 1,300 growers officially registered in 2019 as growers of industrial hemp. That year, they planted 2,200 acres of hemp.⁹⁹ Some small-scale agriculture R&D work is underway (industrial hemp, greenhouse agriculture) which may lead to new products and markets in the region.
- Appalachian Sustainable Development has a well-defined network of farmers/growers for strong markets of different farm types and sizes. They provide training, tools, technical assistance and resources needed for success. This includes workforce program for those with employment barriers such as disabilities, low income, limited education, etc. and entrepreneurship support to families who wish to establish gardens at home. The non-profit has an active regional business network that connect growers to markets, which is critical to expand to have a more prosperous agricultural sector in the region.

⁹⁶ EMSI 2017.1; QCEW Employees, Non-QCEW Employees, Self-Employed, and Extended Proprietors.

⁹⁷ Mountain Empire Community College (2022). Smart Farming I. Retrieved from: <https://www.mecc.edu/pathways/smart-farming-i/>

⁹⁸ Southwest Virginia Community College. (2022). Agricultural Programs. Retrieved from: <https://www.swccowa.edu/academics/areas-of-study/agricultural-programs>

⁹⁹ Virginia Department of Agriculture and Consumer Services (April 2021). Industrial Hemp. Retrieved from: <https://www.vdacs.virginia.gov/plant-industry-services-hemp.shtml>

- **There is a growing recreation industry with outdoor recreational resources and activities.** In 2021, Virginia State Parks saw a 1.5% increase in visitors from the previous year and 15% increase over 2019 – with rural regions seeing the largest increase in outdoor recreation tourism.¹⁰⁰
- **There has been a rise of creative industry in recent years across the region: historic, cultural, and artistic amenities.** VCEDA has further supported these endeavors by awarding their Seed Capital Matching Fund Grant to over 130 small business owners.
- **Well-developed and passionate business support organizations and industry ecosystem.** VCEDA’s Seed Capital program, the Small Business Development Center and community college resources support entrepreneurs who invest in the arts, retail and restaurant industries.
- **The majority of VCEDA residents have obtained a high school degree or less.** According to the Kauffman Foundation, the rate of business creation is 0.52 for individuals with less than a high school degree, compared to 0.28 for college graduates. Therefore, entrepreneurial activity rates are highest among those with lower educational attainment.¹⁰¹

Challenges

- The agriculture industry is projected to slightly decline (3%) over the next five years, likely due to automation, innovation, and productivity gains. **Also, agriculture tends to contain lower wage occupations.** Average earnings in VCEDA’s agriculture industry totaled \$38,909, almost \$11,000 less than regional average earnings.
- Limited vocational agriculture education and FFA programs have lead to a lack of understanding of occupations available in agribusiness. The VCEDA region needs better alignment in educational programs with needs of industry.
- Many landowners/farmers retain land as a “retirement” plan however, new farmers are unable to pay expected prices. **The VCEDA region lacks the next generation of growers.**

¹⁰⁰ Virginia Business (February 2022). Take a hike. Retrieved from: <https://www.virginiabusiness.com/article/take-a-hike/>

¹⁰¹ Center for an Urban Future (2013). Launching Low-Income Entrepreneurs. Retrieved from: <https://nycfuture.org/pdf/Launching-Low-Income-Entrepreneurs.pdf>

- Rural entrepreneurs need more education and solutions in accessing capital. In a national survey, 73% stated they are very or somewhat confident they know all the loan and capital options available in their community; however, **59% also agreed they need more information on the types of capital sources that their business might benefit** from.¹⁰²
- **Rural employers struggle greatly to maintain a qualified workforce.** Participants stressed that good employees are difficult to find and maintain. 73% of respondents cited a lack of economic opportunity forces people to leave their community.¹⁰³
- **Healthcare costs and lack of providers are a significant concern of rural entrepreneurs.** Healthcare costs and availability of providers are a major concern, with most surveyees reporting that their only option for care required traveling more than 30 minutes. What's more, almost 1 in 3 rural small business owners (32%) rated healthcare costs as one of the top issues facing their business.¹⁰⁴
- Interviews suggest that networks often play a significant role when founders build initial relationships with investors. In other words, **access to capital is strongly tied to the types of connections that entrepreneurs have.**
- **A strong network is one of the key differences between rural founders who scaled their companies and those who did not.** Founders who scaled were 80 percent more likely to have mentors who were successful entrepreneurs themselves, according to the interview and survey data.¹⁰⁵ These founders reported similar access to successful mentors and personal networks as their counterparts in urban areas.

Opportunities

- Focus entrepreneurship that encourages traded sector growth, such as the attraction of breweries and distilleries. This would lead to **a higher potential for higher wage jobs**, as breweries have technical and service-related occupations, as well as a job market outside of the region.

¹⁰² Small Business Majority (February 2019). Examining the Unique Opportunities and Challenges Facing Rural Small Businesses. Received from: <https://smallbusinessmajority.org/our-research/entrepreneurship-freelance-economy/examining-unique-opportunities-and-challenges-facing-rural-small-businesses>

¹⁰³ Small Business Majority (February 2019). Examining the Unique Opportunities and Challenges Facing Rural Small Businesses. Received from: <https://smallbusinessmajority.org/our-research/entrepreneurship-freelance-economy/examining-unique-opportunities-and-challenges-facing-rural-small-businesses>

¹⁰⁴ Small Business Majority (February 2019). Examining the Unique Opportunities and Challenges Facing Rural Small Businesses. Received from: <https://smallbusinessmajority.org/our-research/entrepreneurship-freelance-economy/examining-unique-opportunities-and-challenges-facing-rural-small-businesses>

¹⁰⁵ Endeavor (September 2021). Rural Entrepreneurship in America. Retrieved from: <https://endeavor.org/wp-content/uploads/2021/09/Rural-Entrepreneurship-in-the-United-States.pdf>

- **In the past two decades, there has been a shift in agricultural products demand that has potential implication for existing agriculture and forestry activities in the VCEDA region.** U.S. consumers are consuming less red meats, fluid milk, processed produce and some dairy products (ex. processed cheese).¹⁰⁶ Consumption has increased for chicken and eggs, some fresh vegetables and fruits, and for several specialty dairy products (cheese and yogurt).
- **Better align educational programs with industry needs, supporting agriculture and forestry entrepreneurship.** For example, develop partnerships between two community colleges (SWCC and MECC) and VCE to deliver existing curriculum, including Virginia Master Cattleman Course; Virginia Master Forester Course.¹⁰⁷
- Expand the SWVA 4-H Educational Center Livestock Camp and Program located in Abingdon to the VCEDA region to offer internships to immerse students in real-world opportunities that develop relationships with agricultural firms and people employed in a variety of agriculture careers.
- **Foundation for strong cooperative partnerships towards economic development in region.** For example, the Solar Workgroup of SWVA, a regional cooperative initiative to grow Southwest Virginia's renewable energy industry, launched as a collaboration between nonprofits, community action agencies, colleges, planning district commissions, and state agencies.¹⁰⁸ The goal is to create more jobs to locally root the solar industry and attract new investments into SWVA.
- **The VCEDA region has the ability to market universal broadband coverage coming to residents and businesses in the near future.** For example, in Dec. 2021 an additional round of Virginia Telecommunications Initiative (VATI) funding resulted in \$23.5 millions of grant funding, which was leveraged with private investment. These projects work to promote both homes and businesses that do not have current access to high-speed internet. Tazewell and Buchanan Counties will both achieve universal broadband coverage.¹⁰⁹
- Build upon worker re-entry programs, addressing both recovery and social service needs as well as workforce development pipeline.
- Marketing strengths and assets within the region to boost community pride and workforce pipeline.

¹⁰⁶ We use food availability as a proxy for consumption. Food availability is the supply of that particular commodity in any given year. This figure includes imports (+), exports (-), and non-food uses (-).

¹⁰⁷ GOVA Region 1 Growth and Diversification Plan. Retrieved from: <https://www.goswva.org/growth-diversification-plan>

¹⁰⁸ Solar Workgroup of Southwest Virginia. Retrieved from: <https://swvasolar.org/>

¹⁰⁹ Michigan Economic Growth Institute (February 2022). Southwest Virginia Energy Storage and Electrification Manufacturing Jobs Project.

- Further development through Main Street revitalization and preservation programs to become attractions for residents within and outside of the region. If possible, provide incentives for businesses to participate in wayfinding solutions such as sign improvements to ensure everyone is aware of the tourism attractions available in the community.

Conclusion

This target industry strategic analysis revealed four target industries that the VCEDA organization should prioritize to promote job growth and investment: advanced manufacturing, electronic information technology, energy related enterprises, and creative tourism. Based on these findings and the challenges and opportunities shown within each industry cluster, key recommendations for the future growth of the region are:

- **Improve the quantity and quality of shovel ready sites in the region:** Many sites currently found in the region are smaller than desired by larger manufacturing prospects. Advancing sites create an opportunity for greater import substitution with more companies satisfying supply chain requirements in the VCEDA region.
- **Collaborate with regional educational institutions to align programs with industry needs:** Develop partnerships with SWCC and MECC to eliminate skill gaps and create a pathway to internships, apprenticeships, and higher-wage jobs in target industries.
- **Create a foundation for cooperative partnership initiatives and alliances in the region:** Strengthening collaborations between nonprofits, community action agencies, educational institutions, planning district commissions, and employers to bring more local jobs and new investments into SWVA.
- **Market universal broadband coverage coming to residents and businesses:** Although there are still areas within the region lacking broadband access, the additional round of VATI funding that resulted in universal broadband in Tazewell and Buchanan Counties can be marketed to attract prospective businesses and residents.
- **Offer entrepreneurial services and resources to assist early-stage companies in the region:** Focusing on entrepreneurial opportunities within the target sectors and providing supportive resources will advance small businesses in the VCEDA region. Examples include utilizing the VCEDA Renewable Energy Fund, the Seed Capital Fund, and focusing on traded sector growth such as breweries and distilleries.

Appendix: Target Cluster Data

Advanced Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		2,560	2,781	2,839	221	9%			165	\$57,544

1. Machinery Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		644	793	758	149	23%			122	\$60,637
333131	Mining Machinery & Equip. Manuf.	445	493	403	48	11%	155.26	\$43,430,81	3	\$72,702
333120	Construction Machinery Manuf.	95	46	53	-49	-52%	1.9	\$4,220,932	-46	\$43,286
333922	Conveyor & Conveying Equip. Manuf.	26	19	19	-7	-27%	1.55	\$2,282,102	-11	\$55,950
333924	Industrial Truck, Tractor, Trailer, & Stackers Machinery Manuf.	76	46	23	-30	-39%	4.87	\$7,232,707	-59	\$75,393
339113	Surgical Appliance & Supplies Manuf.	<10	10	<10	N/A	N/A	0.27	\$1,952,029	-2	\$78,164
339114	Dental Equip. & Supplies Manuf.	<10	25	36	N/A	N/A	4.44	\$3,818,176	30	\$83,180
339115	Ophthalmic Goods Manuf.	<10	20	27	N/A	N/A	2.32	\$3,203,207	21	\$69,307
339999	All Other Miscellaneous Manuf.	<10	11	13	N/A	N/A	0.37	\$536,202	4	\$31,855
333112	Lawn & Garden Tractor & Home Lawn Manuf.	0	76	122	76	N/A	11.3	\$7,138,388	122	\$46,940
333132	Oil and Gas Field Machinery & Equip. Manuf.	0	13	20	13	N/A	0.8	\$1,011,659	21	\$59,383
333243	Sawmill, Woodworking, & Paper Machinery Manuf.	0	16	26	16	N/A	3.6	\$1,342,878	26	\$59,460
339920	Sporting & Athletic Goods Manuf.	2	18	15	16	811%	0.9	\$1,405,919	13	\$52,030

2. Fabricated Metal Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		630	682	728	52	8%			124	\$50,307
332420	Metal Tank Manuf.	1	264	342	263	35516%	21.68	\$22,377,391	341	\$54,255
332312	Fabricated Structural Metal Manuf.	45	67	64	22	49%	2.04	\$5,533,701	18	\$60,872
332313	Plate Work Manuf.	400	210	231	-190	-48%	13.17	\$16,706,124	-159	\$60,713
332322	Sheet Metal Work Manuf.	16	22	13	6	38%	0.53	\$974,835	-4	\$33,903
332710	Machine Shops	140	106	63	-34	-24%	1.05	\$4,392,725	-68	\$36,868
332991	Ball and Roller Bearing Manuf.	28	13	<10	-15	-54%	1.79	\$988,091	-15	\$55,232
332999	All Other Misc. Fabricated Metal Product Manuf.	<10	<10	15	N/A	N/A	0.34	\$778,874	11	N/A

3. Wood Product and Furniture Related Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
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Total		1,251	1,254	1,298	41	207%			133	\$44,756
113210	Forest Nurseries & Gathering of Products	19	<10	<10	N/A	N/A	4.58	\$615,910	-10	N/A
113310	Logging	341	210	194	-131	-38%	5.58	\$11,140,647	-108	\$46,994
321113	Sawmills	233	239	236	6	3%	7.77	\$19,926,420	18	\$49,677
321912	Cut Stock, Resawing Lumber, & Planing	72	141	150	69	96%	25.57	\$10,222,881	79	\$47,477
321920	Wood Container & Pallet Manuf.	19	<10	<10	N/A	N/A	0.38	\$383,257	-13	N/A
321992	Prefabricated Wood Building Manuf.	33	55	66	22	67%	8.18	\$2,776,526	27	\$33,165
115310	Support Activities for Forestry	22	19	25	-3	-14%	1.53	\$689,508	2	\$37,503
326150	Urethane and Other Foam Product (except Polystyrene) Manuf.	202	235	287	33	16%	18.06	\$26,630,335	92	\$81,002
113110	Timber Tract Operations	3	3	<10	0	18%	1.18	\$149,446	0.6	\$43,093
115112	Soil Prep., Planting, and Cultivating	45	22	19	-23	-52%	0.84	\$1,085,138	-20.5	\$50,407
115115	Farm Labor Contractors and Crew Leaders	61	59	68	-2	-4%	0.51	\$2,114,625	-1.8	\$34,547
337110	Wood Kitchen Cabinet and Countertop Manuf.	6	9	11	3	44%	0.2	\$425,004	2.7	\$42,295
337121	Upholstered Household Furniture Manuf.	0	47	79	47	N/A	2.3	\$1,685,293	47.5	\$22,703
337122	Non-upholstered Wood Household Furniture Manuf.	1	2	<10	1	64%	0.2	\$93,403	0.9	\$43,382
337212	Custom Architectural Woodwork & Millwork Manuf.	0	8	13	8	N/A	0.8	\$665,144	7.8	\$45,899
337910	Mattress Manuf.	193	205	150	12	6%	22.2	\$21,111,817	9.1	\$48,439

4. Electronic Equipment Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		35	52	55	17	49%			6	\$60,550
334417	Electronic Connector Manuf.	35	30	33	-5	-14%	3.79	\$2,693,986	-6	\$68,725
811219	Other Electronic and Precision Equipment Repair and Maintenance	<10	22	22	N/A	N/A	1.59	\$1,813,868	13	\$52,990
334220	Radio & Television Broadcasting & Wireless Communications Equip. Manuf.	<10	<10	<10	N/A	N/A	0.04	\$80,264	0	N/A
334290	Other Communications Equip. Manuf.	<10	<10	<10	N/A	N/A	0.07	\$62,058	0	N/A
335121	Residential Electric Lighting Fixture Manuf.	<10	<10	<10	N/A	N/A	0.29	\$28,722	0	N/A
335314	Relay & Industrial Control Manuf.	<10	<10	<10	N/A	N/A	0.17	\$70,443	-2	N/A

Electronic Information Technology

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		3,160	3,235	3,564	75	2%			125	\$49,774

1. Software Development

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		965	981	1,105	16	2%			-16	\$47,788
511210	Software Publishers	<10	<10	12	N/A	N/A	0.05	\$363,669	7	N/A
519130	Internet Publishing & Broadcasting & Web Search Portals	<10	13	15	N/A	N/A	0.1	\$1,087,998	2	\$34,064
541430	Graphic Design Services	12	10	13	2	-17%	0.13	\$440,042	2	\$27,511
541511	Custom Computer Programming Services	19	13	14	-6	-32%	0.03	\$744,224	-9	\$51,492
541512	Computer Systems Design Services	551	561	667	10	2%	1.28	\$43,179,316	11	\$62,551
541519	Other Computer Related Services	11	26	39	15	136%	0.46	\$1,297,384	27	\$34,718
541330	Engineering Services	372	358	345	-14	-4%	0.88	\$28,831,759	-56	\$76,390

2. Telecommunications and Data Centers

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		1,524	1,636	1,875	112	7%			448	\$46,722
561421	Telephone Answering Services	206	64	39	-142	-69%	3.56	\$1,822,780	-198	\$31,508
561422	Telemarketing Bureaus & Other Contact Centers	858	1,184	1,443	326	38%	6.99	\$68,844,818	627	\$37,667
518210	Data Processing, Hosting, and Related Services	27	60	74	33	122%	0.36	\$8,484,340	41	\$56,112
517312	Wireless Telecommunications Carriers	<10	28	81	N/A	N/A	0.64	\$9,773,132	-180	\$68,894
517311	Wired Telecommunications Carriers	338	132	40	N/A	N/A	0.6	\$1,597,352	33	\$54,323
561499	All Other Business Support Services	10	24	31	14	131%	0.51	\$1,183,490	21	\$42,786
443142	Electronics Stores	84	144	167	60	71%	1.01	\$7,375,958	104	\$35,763

3. IT Support Services

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		671	618	584	-53	-8%			-118	\$55,141
541690	Other Scientific & Tech. Consulting Services	104	29	21	-75	-72%	0.22	\$1,927,221	-93	\$60,461
561110	Office Administrative Services	122	157	174	35	29%	0.48	\$6,900,762	40	\$39,384
811212	Computer & Office Machine Repair & Maint.	23	14	15	-9	-39%	0.59	\$516,303	-7	\$37,435
811213	Communication Equip. Repair & Maint.	48	31	22	-17	-35%	3.68	\$2,492,349	-29	\$92,458
561320	Temporary Help Services	374	387	352	13	3%	0.38	\$29,737,137	-29	\$45,966

Energy Related Enterprises

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		1,599	1,382	1,381	-217	-14%			-288	\$83,227

1. Renewable Energy and Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		1,209	1,140	1,119	-69	-6%			-142	\$87,516
221112	Fossil Fuel Electric Power Generation	43	38	33	-5	-12%	1.34	\$5,793,581	2	\$152,9224
221117	Biomass Electric Power Generation	<10	<10	<10	N/A	N/A	3.87	\$862,773	3	N/A
221122	Electric Power Distribution	199	189	191	-10	-5%	2.45	\$30,656,417	-18	\$157,685
221310	Water Supply & Irrigation System	50	108	143	58	117%	5.14	\$19,214,857	86	\$87,348
237110	Water & Sewer Line and Related Structures Construction	133	212	238	79	59%	3.07	\$14,274,959	89	\$62,483
237130	Power & Communication Line and Related Structures Construction	100	107	82	7	7%	1.34	\$9,136,249	-45	\$69,281
237990	Other Heavy & Civil Engineering Construction	<10	10	<10	N/A	N/A	0.24	\$1,115,863	3	\$46,806
238210	Electrical Contractors & Other Wiring Installation Contractors	224	91	65	-133	-59%	0.26	\$6,850,929	-184	\$49,405
541330	Engineering Services	355	347	334	-8	-2%	0.94	\$28,831,759	-54	\$76,362
541360	Geophysical Surveying & Mapping Services	13	26	33	13	100%	5.66	\$1,928,919	22	\$63,349
541690	Other Scientific & Technical Consulting Services	89	14	<10	-75	-84%	0.19	\$1,774,305	-93	\$75,510

2. Battery Storage and Manufacturing

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		390	242	262	-148	-38%			-146	\$63,058
221121	Electric Bulk Power Transmission & Control	<10	<10	<10	N/A	N/A	0.04	\$108,275	0	N/A
335311	Power, Distribution, & Specialty Transformer Manuf.	364	227	252	-137	-38%	24.39	\$14,749,828	-134	\$61,411
335999	All Other Miscellaneous Electrical Equipment & Component Manuf.	<10	<10	<10	N/A	N/A	0.11	\$33,759	0	N/A
423610	Electrical Apparatus & Equipment, Wiring Supplies, and Related Equipment	25	15	10	-10	-40%	0.24	\$1,408,738	-17	\$82,473

Creative Tourism

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		4,372	3,992	4,063	-486	-5%			3	\$29,052

1. Artisan Restaurants and Traded-Sector Pursuits

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		3,959	3,616	3,720	-343	-9%			-125	\$23,005
722511	Full-Service Restaurants	1,131	944	1,044	-187	-17%	0.61	\$19,113,271	141	\$20,001
722513	Limited-Service Restaurants	2,750	2,600	2,591	-150	-5%	1.68	\$45,412,620	-138	\$17,203
722320	Caterers	53	52	61	-1	-2%	0.57	\$1,641,995	25	\$31,540
722330	Mobile Food Services	25	20	24	-5	-20%	0.42	\$800,573	-5	\$40,157
453998	Other Miscell. Retailers (i.e. candle, collectors' items)	73	72	65	-1	-2%	0.56	\$3,257,325	-12	\$32,890
452319	Other General Merch.	581	555	531	-26	-4%	2.79	\$19,146,405	-123	\$21,765
711510	Independent Artists, Writers, and Performers	114	107	108	-7	-6%	0.27	\$1,362,082	24	\$12,643
454390	Other Direct Selling Establishments	407	356	332	-50	-12%	0.89	\$7,209,193	-38	\$7,839

2. Food-Based Agriculture and Research

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		245	231	178	-139	-2			-129	\$36,686
312120	Breweries	<10	<10	<10	N/A	N/A	0.22	\$1,070,287	2	N/A
312130	Wineries	11	<10	<10	N/A	N/A	0.41	\$733,930	3	36420.80353
312140	Distilleries	<10	0	<10	N/A	N/A	0.71	\$2,440,845	8	N/A
424490	Other Grocery Products Merchant Wholesalers	78	132	89	-43	-33%	0.92	\$7,671,571	-45	\$59,240
445210	Meat Markets	18	21	19	-2	-9%	0.78	\$628,962	-4	\$27,871
445299	Other Specialty Food Stores (i.e. dairy, coffee)	11	20	12	-8	-39%	0.64	\$220,066	-5	\$16,535
445230	Fruit and Vegetable Markets	23	28	26	-3	-10%	0.70	\$671,759	3	\$21,223
541690	Other Sci. & Technical Consulting Services	104	28	20	-83	-80%	0.22	\$1,831,804	-95	\$58,826
541714	R&D in Biotechnology	0	<10	<10	N/A	N/A	0.01	\$136,775	1	N/A
541715	R&D in Physical, Eng., & Life Sciences	<10	<10	11	N/A	N/A	0.04	\$461,475	3	N/A

3. Outdoor Recreation

NAICS	Description	2017 Jobs	2021 Jobs	2026 Jobs	2017-2021 Change	2017-2021 % Change	2021 LQ	2021 GRP	Competitive Effect	Avg. Earnings
Total		168	145	165	-4	-2%			-1	\$27,466
451110	Sporting Goods Stores	<10	11	11	N/A	N/A	0.39	\$297,205	1	\$14,658
713990	Other Amusement and Rec. Industries	26	11	10	16	-61%	0.12	\$459,908	-14	\$32,763
721211	RV Parks & Camps	<10	38	60	N/A	N/A	2.39	\$951,046	50	\$19,815
423910	Sport & Recreational Merchant Wholesalers	79	44	41	38	-48%	0.39	\$1,507,263	-35	\$24,962
441210	Recreational Vehicle Dealers	<10	<10	<10	N/A	N/A	0.17	\$101,594	-7	Insf. Data
441228	Motorcycle, ATV, and Other Dealers	36	37	38	2	4%	1.21	\$2,669,783	4	\$45,134