Albemarle County
Target Industry Analysis

March, 2025

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01
Executive Summary

Executive Summary

Albemarle County is a growing and competitive community with strong economic and population growth but also faces some challenges.

To better understand the dynamics of the county's target clusters, we assess them through the lens of competitiveness, equity, and resilience. This analysis is the essential foundation for supporting all future business retention and growth efforts, investment, and incentives, including a narrative that resonates with new enterprises, site-selectors, and talent

The following are some key takeaways from our target industry analysis. We'll then combine those insights with the work we've done so far through our competitive benchmarking assessment and stakeholder engagements and provide a high-level overview of what we've learned so far.

Executive Summary

01: Target Industry Analysis - Key Takeaways

02: Summary Findings So Far

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Target Industry Analysis - Key Takeaways

Takeaway: #1

The County Has a Strong Regional Specialization in Food Processing and Agribusiness

Food Processing and Agribusiness has strong export activity, but low wages and high automation risk could impact workforce stability. It has the highest location quotient (2.33) among the clusters, indicating a strong regional specialization, and generates over $400M in exported sales, making it a key contributor to trade. However, 60.1% of its jobs are at risk of automation, and it has the lowest median wages ($40,215), which may create recruitment and retention challenges.

Takeaway: #2

Bioscience and Life Sciences Has Been a Key Driver of Economic Growth

Bioscience and Life Sciences has the highest economic contribution ($269M GRP) among the clusters and a highly educated workforce (54.7% have a bachelor's degree or higher) - showcasing its competitiveness and resilience. This is also the only cluster where women make up over 50% of the workforce, and it has relatively low automation risk, further reinforcing its long-term sustainability.

Takeaway: #3

While Still Competitive, the Intelligence and National Security Cluster Faces Workforce Challenges

The Intelligence and National Security cluster benefits from strong regional supply chain integration, but job losses and an aging workforce pose challenges to its long-term sustainability. It has 76.2% of its supply chain requirements met in-region, the highest among all clusters, but has suffered a 17.5% decline in jobs over the last five years. With 26% of the workforce aged 55+, retirements could further strain workforce availability.

Takeaway: #4

Business and Financial Services is a Relatively Diverse Cluster, but it Faces Potential Talent Challenges

Business and Financial Services boasts the most diverse workforce (31.7% non-white workers) of the county's clusters, but it also faces a relatively high automation risk (44.4% of jobs at risk). Additionally, lower-than-average wages compared to national benchmarks could make talent retention more difficult. Despite the County's high educational attainment, this is the only cluster that has a lower share of workers with a Bachelor's degree or higher relative to the national average.

Takeaway: #5

Clean Technology and Renewable Energy is the Fastest-Growing Cluster, but it also Faces Workforce Challenges

With 9.7% job growth over the past 5 years, it outpaces all other clusters. However, 69.5% of workers lack a bachelor's degree, making it the least-educated workforce. Additionally, 29.4% of its workforce is age 55+, presenting future labor shortages if replacements are not developed.

Takeaway: #6

Information Technology has High Earnings and Growth Potential, but the Cluster Isn't as Competitive as Others Yet

With a GRP per worker of $720k, Information Technology leads all clusters in productivity and is expected to grow 15.9% in employment, making it an essential driver of economic expansion in Albemarle. Additionally, IT has the highest industry earnings ($239,166 average earnings per job), reinforcing its attractiveness for talent and business. However, its LQ is the lowest among all clusters (0.62), signaling it's not as competitive as other clusters at a national level.

02

Summary Findings So Far

Takeaway: #1

Workforce Challenges Have Hampered Cluster Competitiveness

Our competitive benchmarking assessment showed that Albemarle County has a workforce shortage, and this directly impacts the competitiveness of its industry clusters. All six clusters in the target industry analysis have a negative competitive effect, meaning job growth in these industries is lower than expected based on national trends. Without increased workforce participation and talent attraction efforts, Albemarle will struggle to maintain and grow its key industries.

Takeaway: #2

An Aging Workforce Poses a Retirement Risk Across All Clusters

The county's prime working-age talent (25-44) is underrepresented - putting every target industry cluster in Albemarle at relatively high retirement risk. This presents a major challenge for business continuity and long-term industry resilience, particularly in Food Processing (28.9%of workforce age 55+), Clean Technology (29.4%), and Business Services (32.1%). Without targeted talent pipeline strategies, Albemarle could see labor shortages in critical sectors over the next decade.

Takeaway: #3

Equity Gaps Exist in Wages, Diversity, and Job Accessibility.

While Business & Financial Services is the most diverse cluster (31.7% non-white workers), several industries—including Clean Technology and Information Technology—have lower diversity than the county average. Additionally, median wages in Albemarle's target clusters tend to be lower than state and national benchmarks, which could impact talent attraction. Addressing equity gaps in wages and career pathways is critical to ensuring inclusive economic growth.

Takeaway: #4

Infrastructure and Workforce Development Investments Are Needed for Industry Growth

Modernizing commercial infrastructure and aligning workforce development programs with industry needs are key to Albemarle's future competitiveness. The county lacks move-in-ready office and industrial space, and many local businesses rely on imported skilled labor due to gaps in the local talent pipeline. Strengthening partnerships between UVA, Piedmont Virginia Community College, and local businesses could help bridge these gaps.

Takeaway: #5

Albemarle's Innovation Pipeline is Strong but Faces Business Retention Challenges.

The County benefits from strong research and innovation assets at UVA and Rivanna Station, yet many early-stage businesses leave due to a lack of commercial space and venture capital access. The Bioscience & Life Sciences cluster, for example, is growing four times slower than the national average. With only 3.9% of Albemarle County's designated development area remaining vacant, opportunities for new commercial development are constrained. Redeveloping dedicated commercial spaces for high-growth firms is essential for retaining businesses in Albemarle.

02
Approach

A cluster is a concentration of related industries in a particular location.
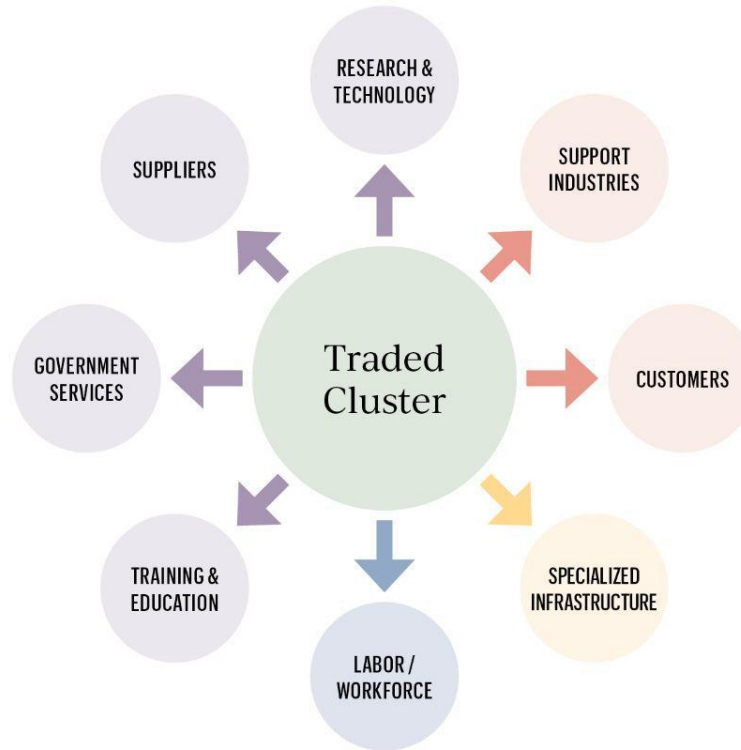
TRADED CLUSTERS

- Groups of related industries that serve markets beyond the region in which they are located.

- Flexible in choice of location of operation (unless linked to natural resources).

- Concentrated in regions with specific competitive advantages.

- Higher wages and levels of innovation

- Examples: Financial Services in New York, IT in Silicon Valley, and Video Production and Distribution in LA.

LOCAL CLUSTERS

- Industries that serve the local market.

- Available in every market because they serve the local population; employment is proportional to the size of the population they serve.

- Prevalent in all markets regardless of competitive advantages

- Higher levels of employment

- Examples: local entertainment, local health services, local commercial services.

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Albemarle County Industry Clusters

We will examine 6 industry clusters for Albemarle County:

1. Bioscience and Life Sciences

2. Business and Financial Services

3. Clean Technology and Renewable Energy

4. Defense and Security

5. Information Technology

6. Food Processing and Agribusiness

Why?

- Legacy cluster

- Part of Albemarle past efforts

- Emerging

Albemarle County can build an export-driven economy that is innovative and forward-looking

Strong Clusters

Priority Clusters
- Competitiveness
- Equity
- Resilience

We will examine the performance of the county's clusters under 3 categories:

COMPETITIVENESS

Location Quotient

Total employment

5-year job growth

Forecasted job growth

Total GRP

GRP per worker

Exports

Location Quotient

EQUITY

Female employment

Non-white employment

Talent with less than a Bachelor's degree

Average earnings per job

RESILIENCE

Number of industries

Supply chain requirements

Retirement risk

Educational attainment

Annual wages

Jobs at risk of automation

03
Target Industry Analysis

Target Industry Analysis

01 - Competitiveness

02 - Equity

03 - Resilience

04 - Key Takeaways

01

Competitiveness

The competitiveness, value, and growth of Albemarle's industry clusters

Albemarle has 3 clusters with a significant competitive advantage

Location Quotient (LQ) - Share of Jobs in Each Cluster in 2024 vs the U.S.
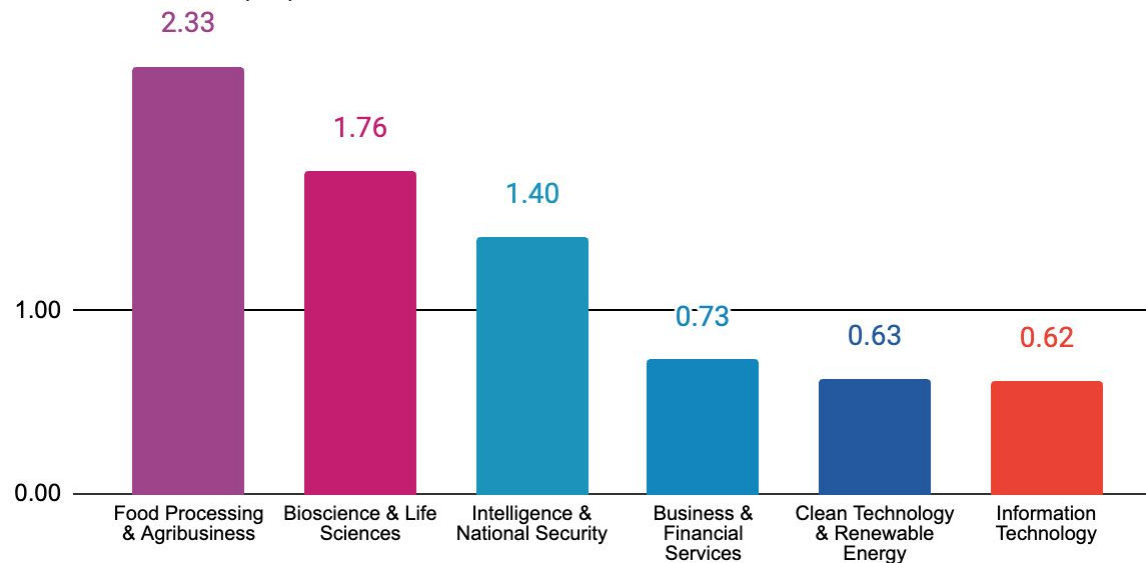
Source: Lightcast

Intelligence and National Security as well as Information Technology are the smallest clusters, both of which have lost jobs over the past 5 years. Clean Technology is the fastest-growing cluster

Number of Jobs in Each Cluster, 2024
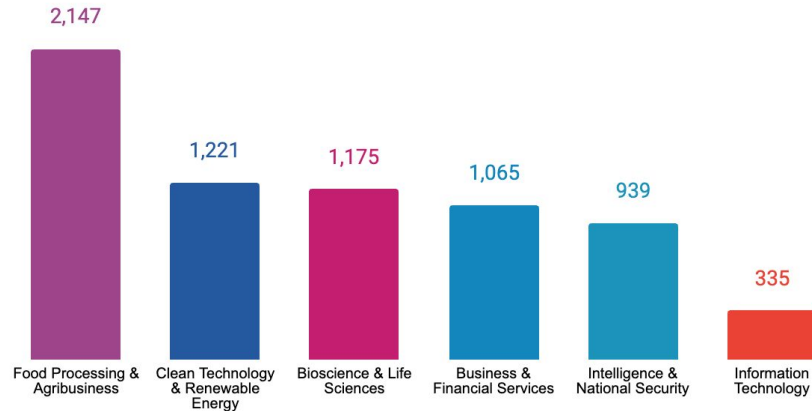
Source: Lightcast

Change in Jobs from 2019-2024 (%), by Cluster
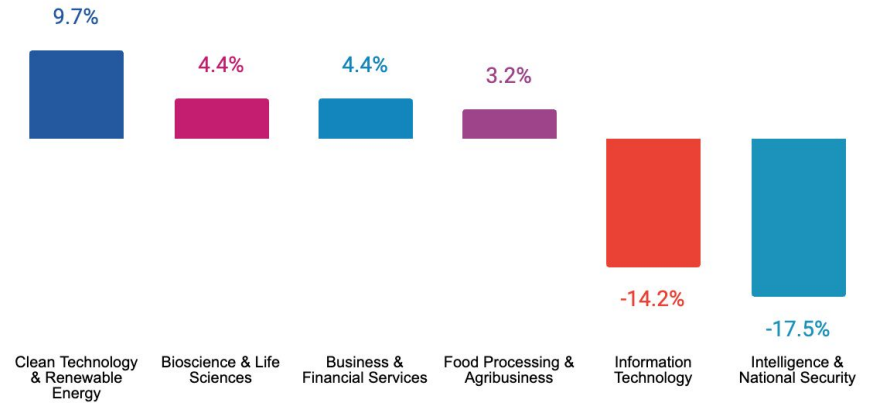
Source: Lightcast

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Growth was varied across LQs

5-Year % Growth by LQ for Clusters
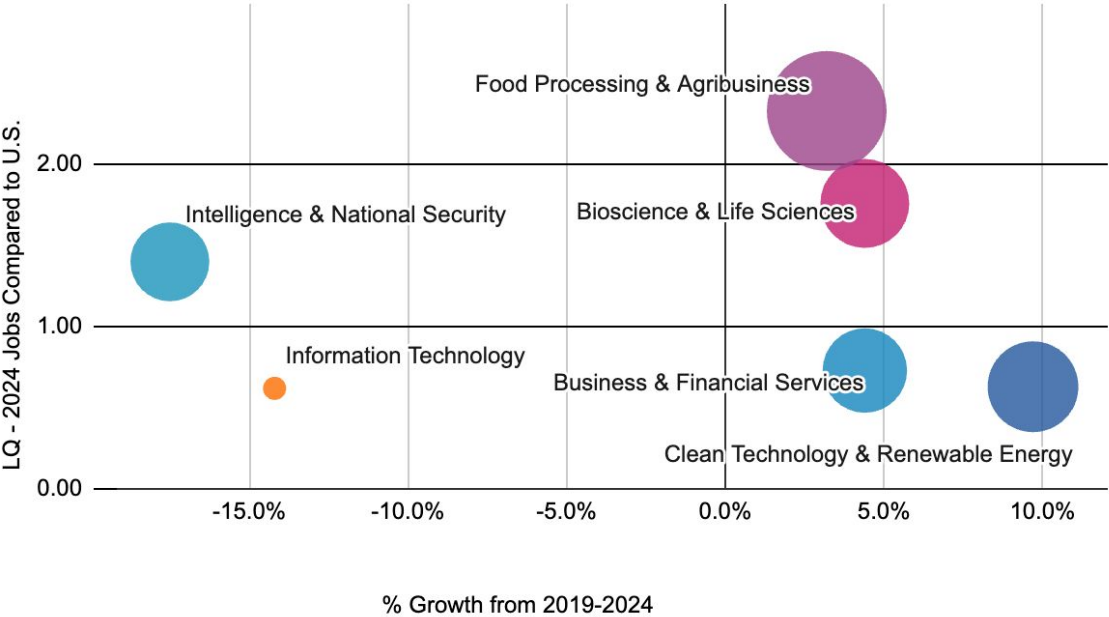
Note: Size of each bubble is based on the cluster's size of employment in 2024.

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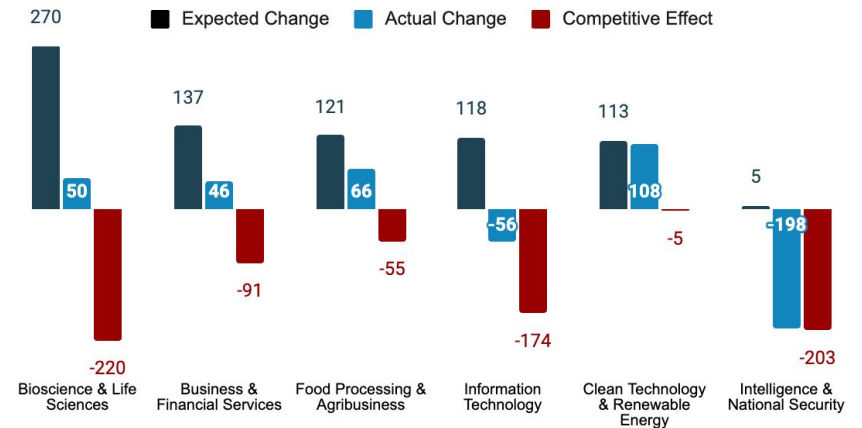# 3 of the county's clusters are experiencing slower growth than the Commonwealth while 5 are growing slower than the nation overall

Change in Jobs from 2019-2024 (%) in Albemarle vs Virginia
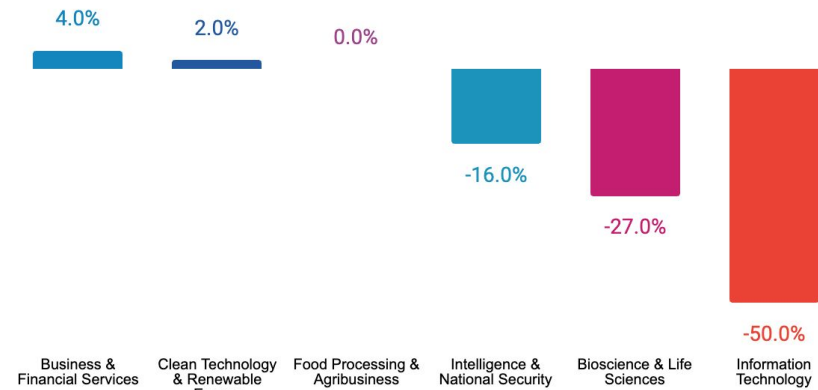
4.0% — Business & Financial Services
2.0% — Clean Technology & Renewable Energy
0.0% — Food Processing & Agribusiness
-16.0% — Intelligence & National Security
-27.0% — Bioscience & Life Sciences
-50.0% — Information Technology

Source: Lightcast

Change in Jobs from 2019-2024 (%) in Albemarle vs the U.S.

1.0% — Clean Technology & Renewable Energy
-2.0% — Food Processing & Agribusiness
-6.0% — Business & Financial Services
-14.0% — Bioscience & Life Sciences
-25.0% — Intelligence & National Security
-49.0% — Information Technology
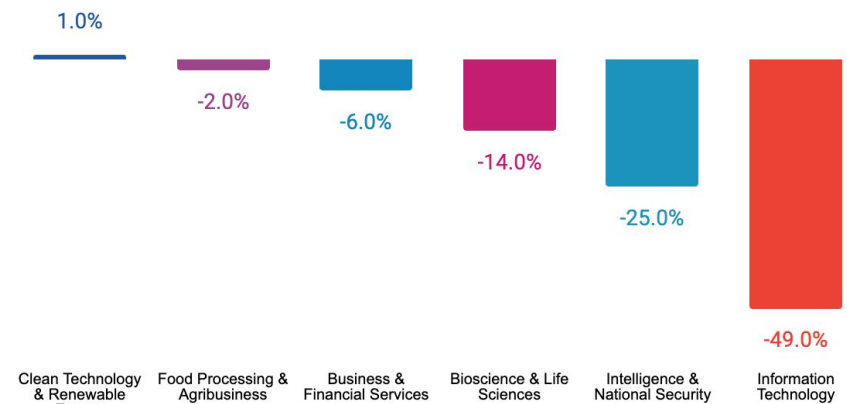
Source: Lightcast

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Most clusters grew more slowly than the nation regardless of their LQ

5-Year % Growth Relative to the U.S. by LQ for Clusters
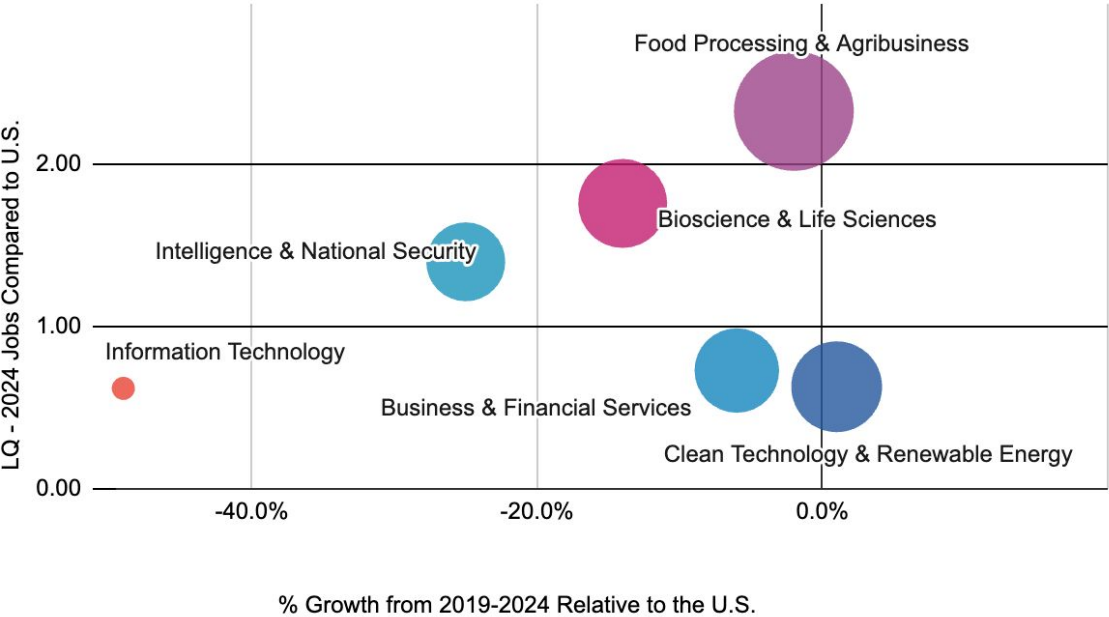
% Growth from 2019-2024 Relative to the U.S.

Note: Size of each bubble is based on the cluster's size of employment in 2024.

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The county has a regional disadvantage in all of its target clusters, which caused jobs to grow more slowly than expected

Expected Change in Jobs from 2019-2024 Based on Industrial Mix and National Growth

Legend: ■ Ind. Mix Effect ■ Nat'l Growth Effect ■ Expected Change

- Bioscience & Life Sciences: 226, 44, 270
- Information Technology: 103, 15, 118
- Business & Financial Services: 97, 40, 137
- Clean Technology & Renewable Energy: 70, 43, 113
- Food Processing & Agribusiness: 40, 81, 121
- Intelligence & National Security: -39, 44, 5
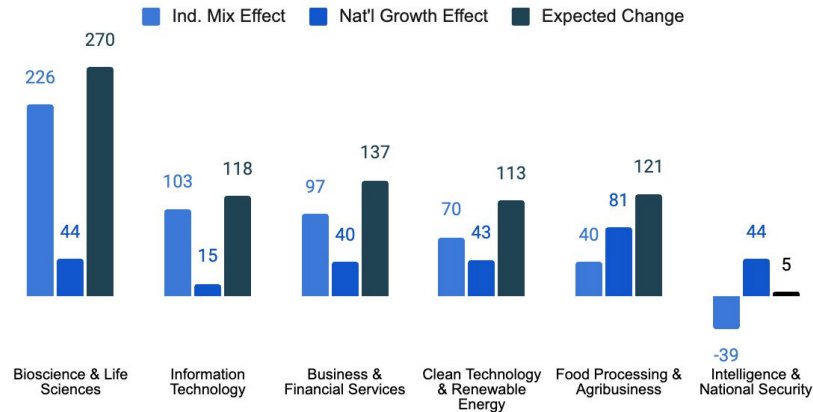
Source: Lightcast

Expected Change in Jobs from 2019-2024 vs Actual Change, by Cluster

Legend: ■ Expected Change ■ Actual Change ■ Competitive Effect

- Bioscience & Life Sciences: 270, 50, -220
- Business & Financial Services: 137, 46, -91
- Food Processing & Agribusiness: 121, 66, -55
- Information Technology: 118, -56, -174
- Clean Technology & Renewable Energy: 113, 108, -5
- Intelligence & National Security: 5, -198, -203

Source: Lightcast

Information Technology is projected to grow the fastest over the next 5 years. 3 of the county's clusters are projected to grow more slowly than the Commonwealth

Projected Change in Jobs from 2024-2029 (%), by Cluster

- Information Technology: 15.9%
- Food Processing & Agribusiness: 7.0%
- Bioscience & Life Sciences: 5.8%
- Business & Financial Services: 4.8%
- Intelligence & National Security: -1.2%
- Clean Technology & Renewable Energy: -2.2%
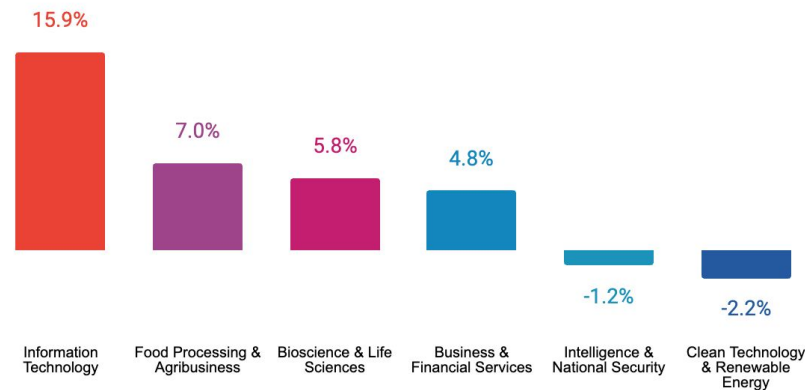
Source: Lightcast

Projected Change in Jobs from 2024-2029 (%) vs Virginia, by Cluster

- Information Technology: 4.0%
- Food Processing & Agribusiness: 4.0%
- Business & Financial Services: 1.0%
- Bioscience & Life Sciences: -3.0%
- Clean Technology & Renewable Energy: -4.0%
- Intelligence & National Security: -5.0%
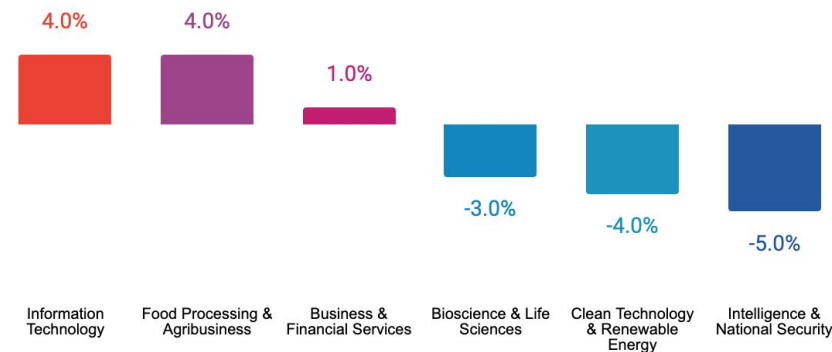
Source: Lightcast

Bioscience and Life Sciences contributes the most to the regional economy while the value of goods and services produced in Information Technology has doubled over the past 5 years

Gross Regional Product (GRP) by Cluster in 2024 (Millions of USD)

Cluster	Value
Bioscience & Life Sciences	$269
Information Technology	$242
Food Processing & Agribusiness	$197
Intelligence & National Security	$191
Clean Technology & Renewable Energy	$173
Business & Financial Services	$155

Source: Lightcast

Growth in GRP from 2019-2024 (%), by Cluster

Cluster	Value
Information Technology	99.7%
Clean Technology & Renewable Energy	59.9%
Bioscience & Life Sciences	50.8%
Food Processing & Agribusiness	49.9%
Business & Financial Services	30.3%
Intelligence & National Security	-10.7%

Source: Lightcast

The GRP of 3 of the county's cluster has grown faster than the Commonwealth over the past 5 years

Growth in GRP from 2019-2024 (%) vs Virginia, by Cluster

14.9% — Clean Technology & Renewable Energy
12.1% — Business & Financial Services
12.1% — Information Technology
-0.9% — Food Processing & Agribusiness
-9.5% — Bioscience & Life Sciences
-22.5% — Intelligence & National Security
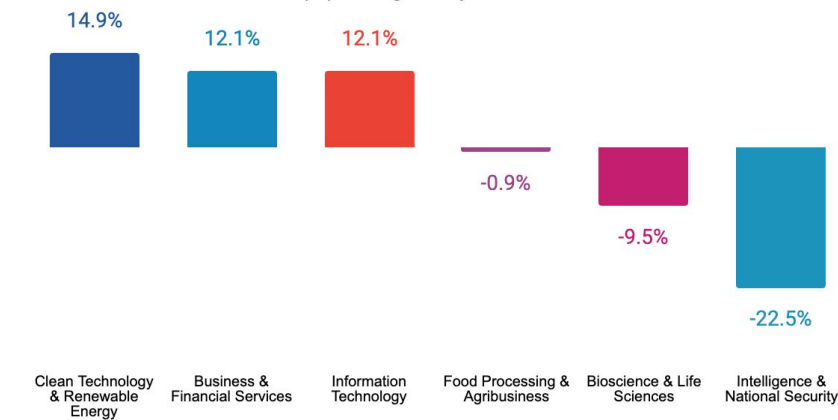
Source: Lightcast

Growth in GRP from 2019-2024 (%) vs U.S., by Cluster

25.7% — Information Technology
24.2% — Clean Technology & Renewable Energy
10.2% — Bioscience & Life Sciences
4.2% — Business & Financial Services
-9.7% — Food Processing & Agribusiness
-30.1% — Intelligence & National Security

Source: Lightcast

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Information Technology is the most productive cluster, while food processing and agribusiness falls behind compared to the U.S.

GRP per Worker in 2024, by Cluster
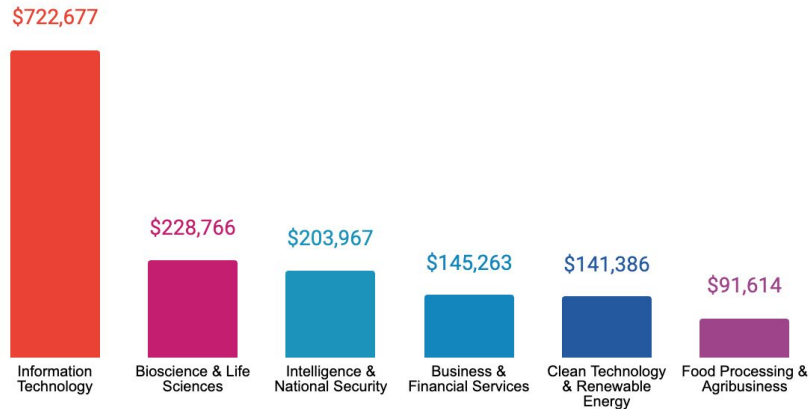
Source: Lightcast

LQ - GRP per Worker in 2024 vs U.S.

Source: Lightcast

The Food Processing and Agribusiness cluster had over $400 million in sales exported out of the region

Share of Exported Sales in 2024, by Cluster
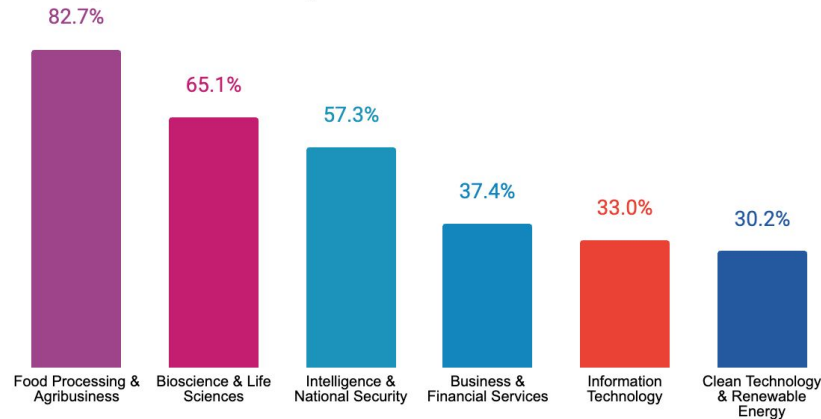
Source: Lightcast

LQ - Share of Exported Sales vs Virginia
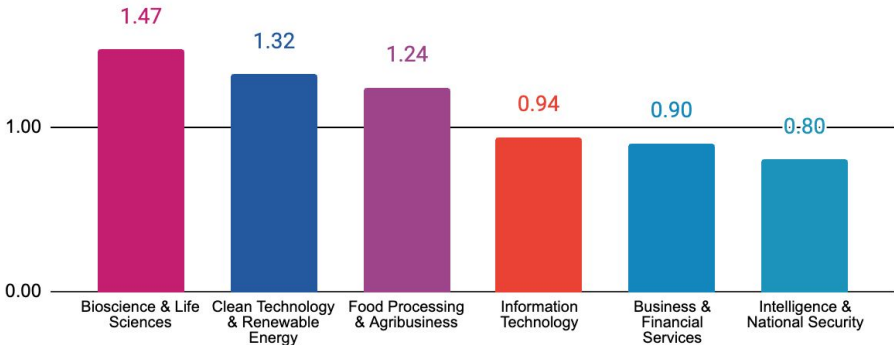
Source: Lightcast

Competitiveness

Cluster Description	Overall LQ	2024 Jobs	2019-2024 % Job Growth	2019-2024 % Job Growth vs VA	2024-2029 % Job Growth	GRP (Millions)	2019-2024 % Growth GRP	GRP per Worker	Exported Sales (%)
Information Technology	0.62	335	-14.2%	-50.0%	15.9%	$242	99.70%	$722,677	33.0%
Clean Technology & Renewable Energy	0.63	1,221	9.7%	2.0%	-2.2%	$173	59.90%	$141,386	30.2%
Business & Financial Services	0.73	1,065	4.4%	4.0%	4.8%	$155	30.30%	$145,263	37.4%
Intelligence & National Security	1.40	939	-17.5%	-16.0%	-1.2%	$191	-10.70%	$203,967	57.3%
Bioscience & Life Sciences	1.76	1,175	4.4%	-27.0%	5.8%	$269	50.80%	$228,766	65.1%
Food Processing & Agribusiness	2.33	2,147	3.2%	0.0%	7.0%	$197	49.90%	$91,614	82.7%

02

Equity

The opportunities for all community members in Albemarle's industry clusters

Bioscience and Life Sciences is the only cluster where women account for over 50% of the workforce. Food Processing and Agribusiness has a larger share of women relative to the national average

Share of Women in each Cluster, 2024
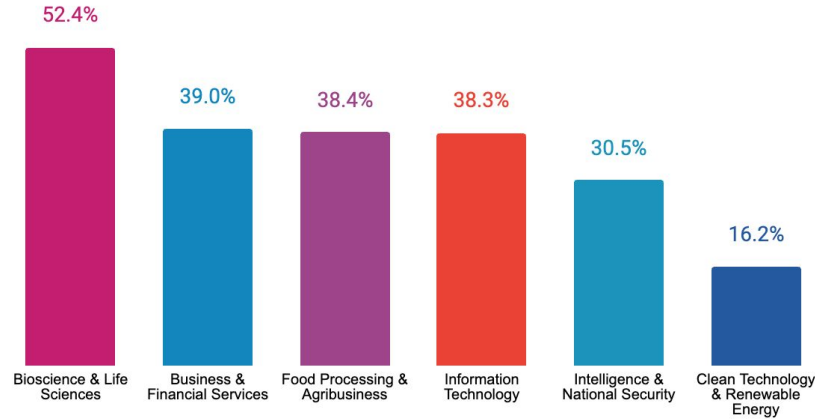
Source: Lightcast

LQ - Share of Women in Each Cluster vs U.S., 2024
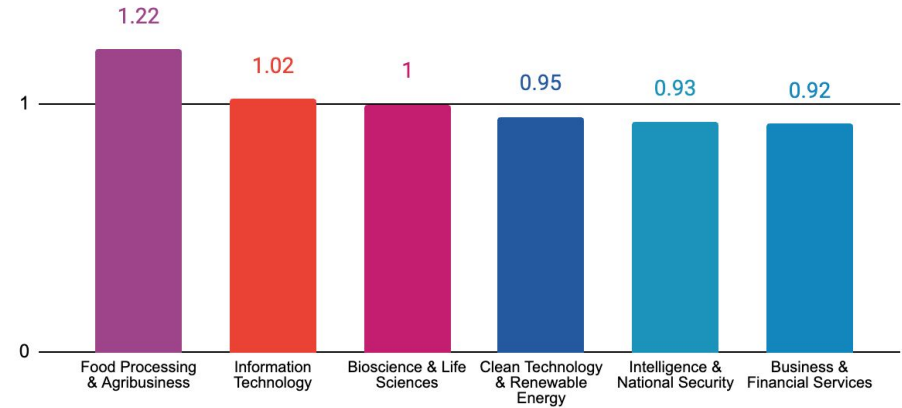
Source: Lightcast

Business and Financial Services has the most diverse workforce, while 4 of the county's target clusters have a higher share of Black or African American workers relative to the nation overall

Share of Non-white Workers in Each Cluster, 2024

- Business & Financial Services: 31.7%
- Intelligence & National Security: 27.8%
- Bioscience & Life Sciences: 24.0%
- Food Processing & Agribusiness: 23.3%
- Clean Technology & Renewable Energy: 21.7%
- Information Technology: 21.1%

(26.0% reference line)
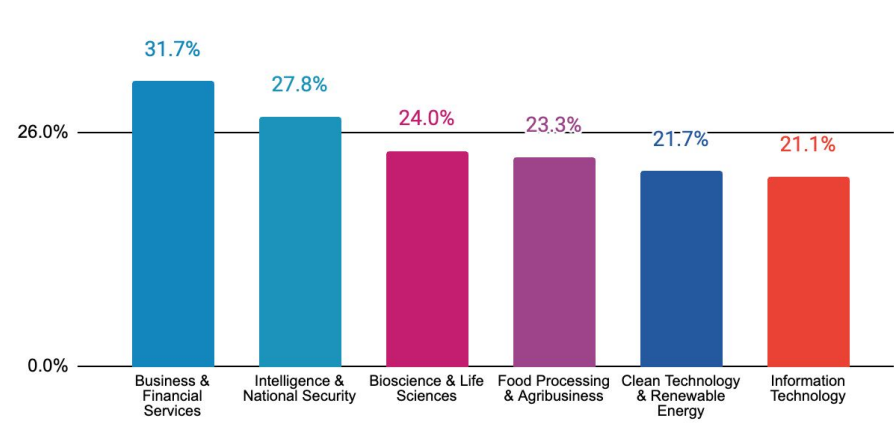
Source: Lightcast

Share of Black or African American Workers in Each Cluster, 2024

- Business & Financial Services: 13.3%
- Bioscience & Life Sciences: 11.0%
- Clean Technology & Renewable Energy: 11.0%
- Intelligence & National Security: 9.3%
- Food Processing & Agribusiness: 8.2%
- Information Technology: 7.5%

(8.8% reference line)
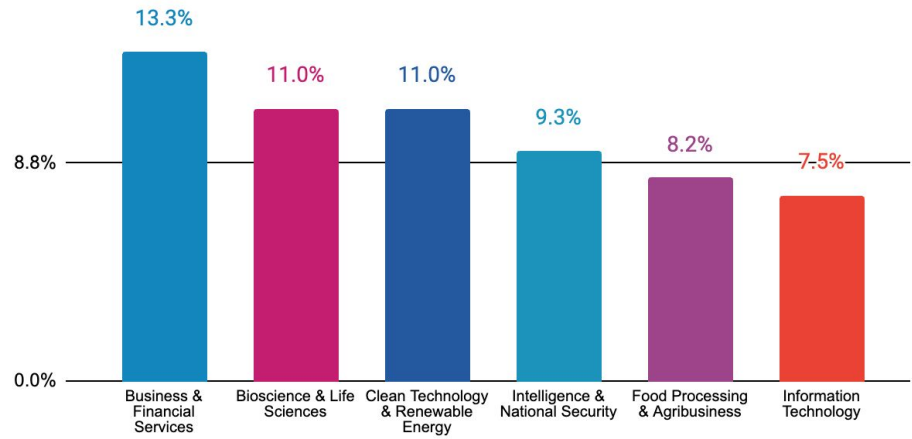
Source: Lightcast

Note: 26% is the share of non-white individuals in the county; 8.8% is the share of Black or African American individuals in the county

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The county's Business and Food Processing clusters have nearly twice the share of Hispanic or Latino workers than the county overall, while Intelligence and Information Technology clusters have a larger share of Asian workers

Share of Hispanic or Latino Workers in Each Cluster, 2024

Cluster	Share
Business & Financial Services	12.7%
Food Processing & Agribusiness	12.2%
Clean Technology & Renewable Energy	8.3%
Bioscience & Life Sciences	4.8%
Intelligence & National Security	4.2%
Information Technology	3.5%

7.3%
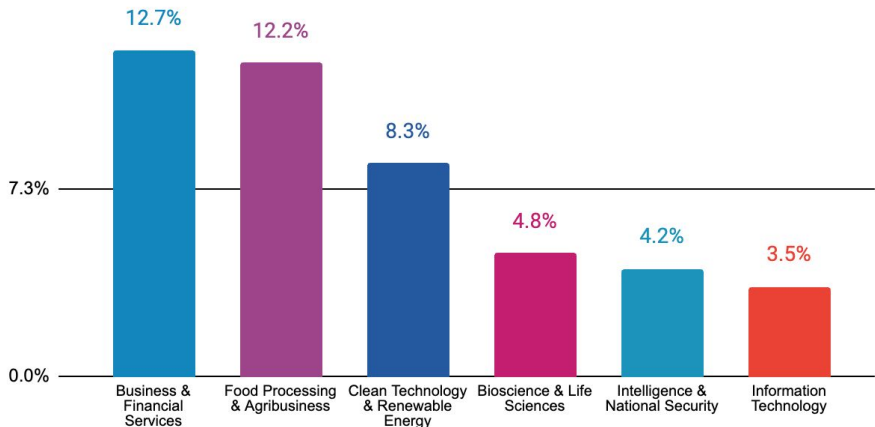
Source: Lightcast

Share of Asian Workers in Each Cluster, 2024

Cluster	Share
Intelligence & National Security	12.1%
Information Technology	8.1%
Bioscience & Life Sciences	6.3%
Business & Financial Services	3.5%
Food Processing & Agribusiness	1.5%
Clean Technology & Renewable Energy	1.0%

5.6%
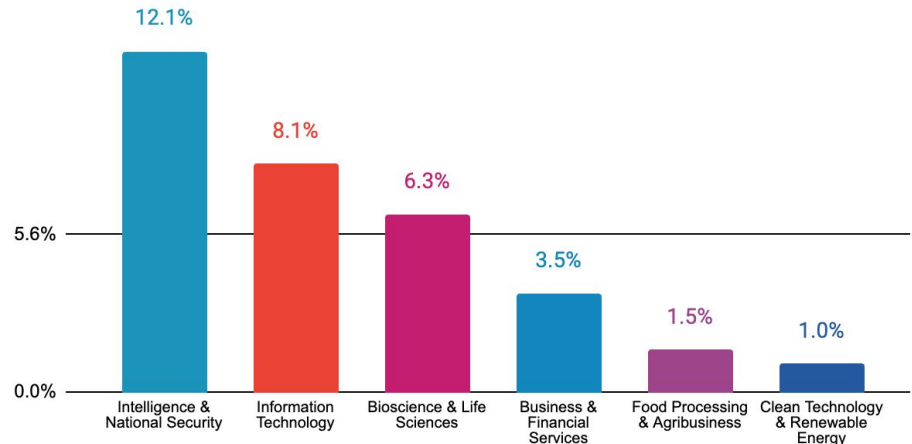
Source: Lightcast

Note: 7.3% is the share of Hispanic or Latino individuals in the county; 5.6% is the share of Asian individuals in the county

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Nearly 7 in 10 employees in Clean Technology and Renewable Energy have less than a Bachelor's Degree

Share of Workers with less than a Bachelor's Degree, by Cluster

69.5% — Clean Technology & Renewable Energy
58.4% — Food Processing & Agribusiness
56.1% — Business & Financial Services
45.3% — Bioscience & Life Sciences
40.6% — Information Technology
38.8% — Intelligence & National Security
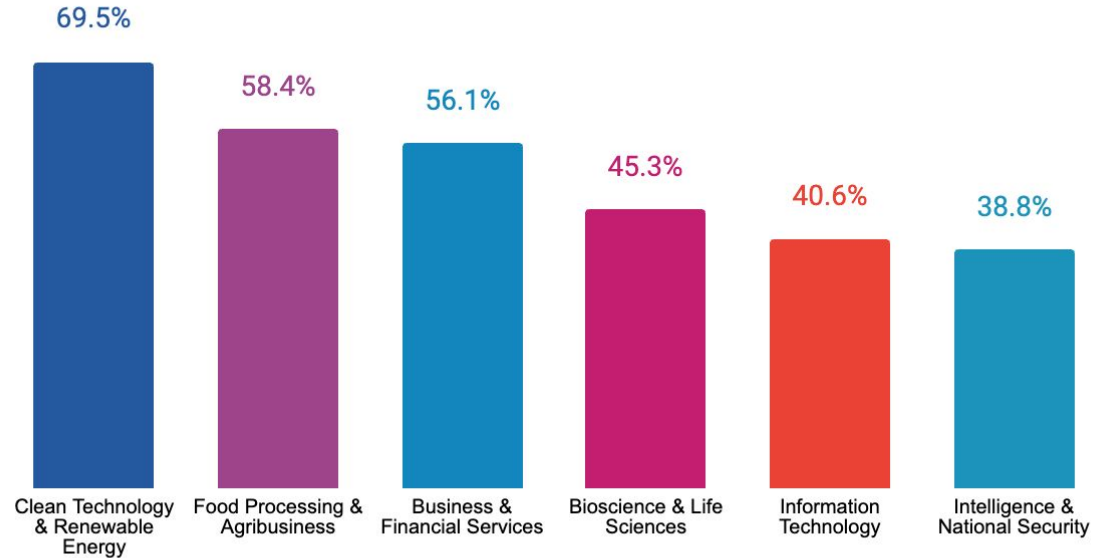
Source: Lightcast

Information Technology has the highest industry earnings per job overall and relative to the national average

Average Industry Earnings per Job in 2024, per Cluster

$239,166 — Information Technology
$127,052 — Intelligence & National Security
$113,907 — Bioscience & Life Sciences
$88,899 — Clean Technology & Renewable Energy
$79,762 — Business & Financial Services
$46,092 — Food Processing & Agribusiness
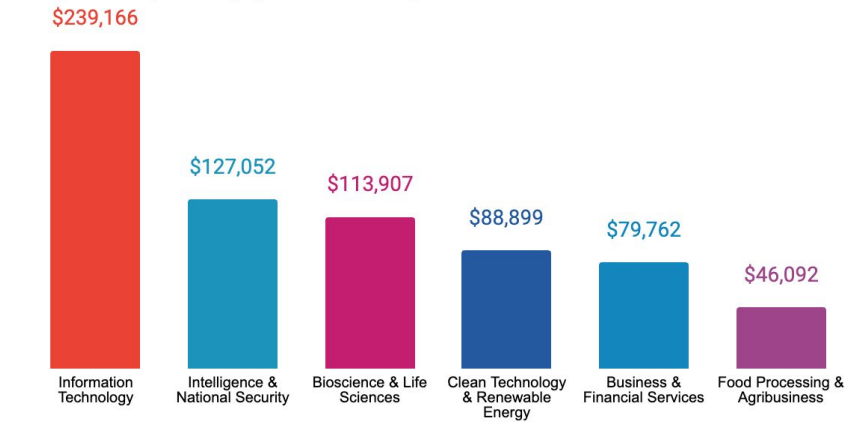
Source: Lightcast

LQ - Average Industry Earnings per Job in 2024 vs U.S., by Cluster
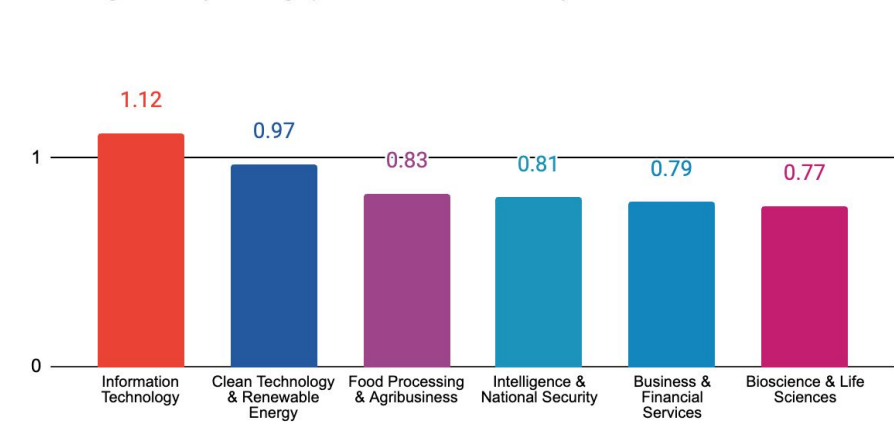
1.12 — Information Technology
0.97 — Clean Technology & Renewable Energy
0.83 — Food Processing & Agribusiness
0.81 — Intelligence & National Security
0.79 — Business & Financial Services
0.77 — Bioscience & Life Sciences

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

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Equity

Cluster Description	% Women	LQ - % women	% Non-white	% Black or African American	% Hispanic or Latino	% Asian	Less than a Bachelor's Degree (%)	% Jobs at Risk of Automation	Average Industry Earnings per Job	LQ - Average Earnings
Bioscience & Life Sciences	52.4%	1.00	24.0%	11.0%	4.8%	6.3%	45.3%	10.6%	$113,907	0.77
Business & Financial Services	39.0%	0.92	31.7%	13.3%	12.7%	3.5%	56.1%	44.4%	$79,762	0.79
Clean Technology & Renewable Energy	16.2%	0.95	21.7%	11.0%	8.3%	1.0%	69.5%	75.0%	$88,899	0.97
Intelligence & National Security	30.5%	0.93	27.8%	9.3%	4.2%	12.1%	38.8%	17.5%	$127,052	0.81
Information Technology	38.3%	1.02	21.1%	7.5%	3.5%	8.1%	40.6%	14.5%	$239,166	1.12
Food Processing & Agribusiness	38.4%	1.22	23.3%	8.2%	12.2%	1.5%	58.4%	60.1%	$46,092	0.83

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03

Resilience

The sustainability of Albemarle's industry clusters and their capacity to re-adapt after shocks

Food Processing and Agribusiness has the most resilient industry base

Number of Industries in Cluster
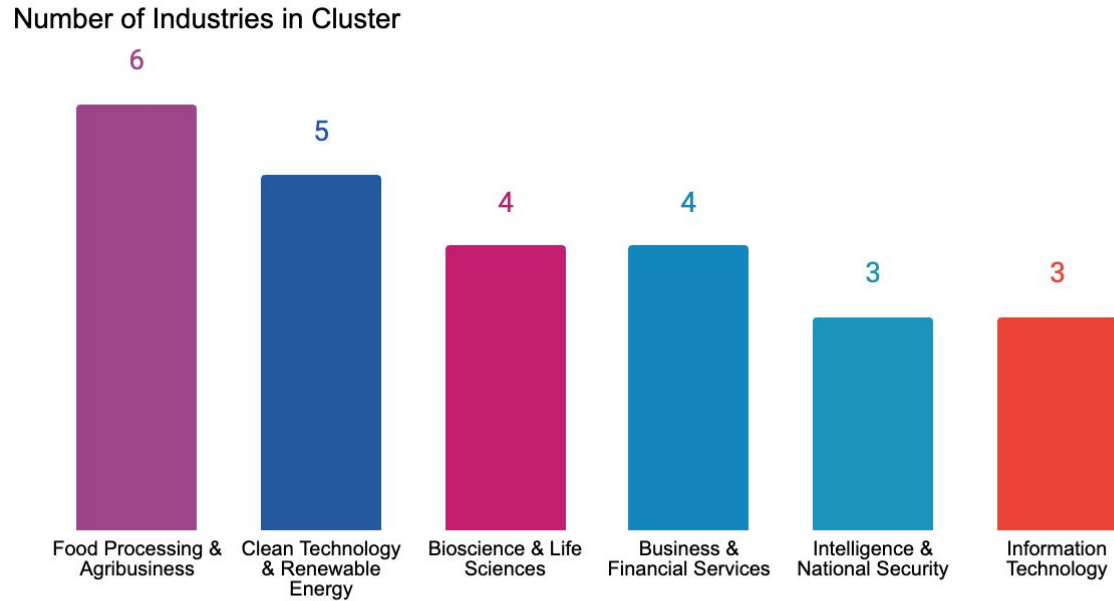
Source: Lightcast

Over 75% of the supply chain requirements for the Intelligence and National Security cluster is met in the region

Share of Demand met In-Region, by Cluster

Cluster	Share
Intelligence & National Security	76.2%
Information Technology	69.1%
Bioscience & Life Sciences	59.5%
Food Processing & Agribusiness	52.8%
Business & Financial Services	51.6%
Clean Technology & Renewable Energy	41.8%
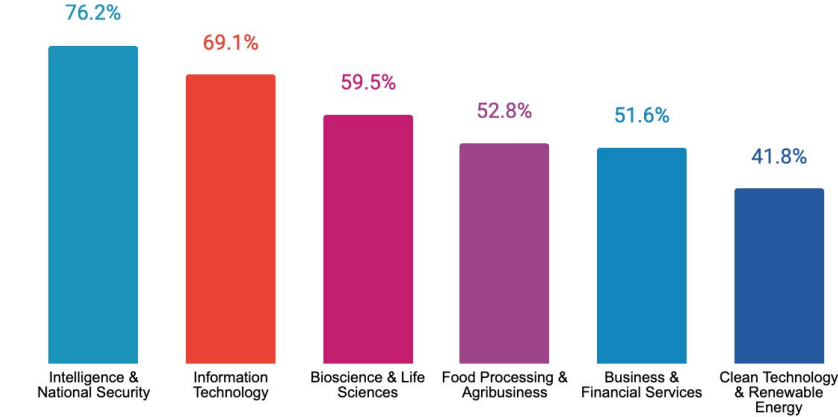
Source: Lightcast

LQ - Share of Demand met In-Region vs Virginia, by Cluster

Cluster	LQ
Food Processing & Agribusiness	1.84
Information Technology	1.28
Bioscience & Life Sciences	1.15
Intelligence & National Security	0.95
Business & Financial Services	0.71
Clean Technology & Renewable Energy	0.55
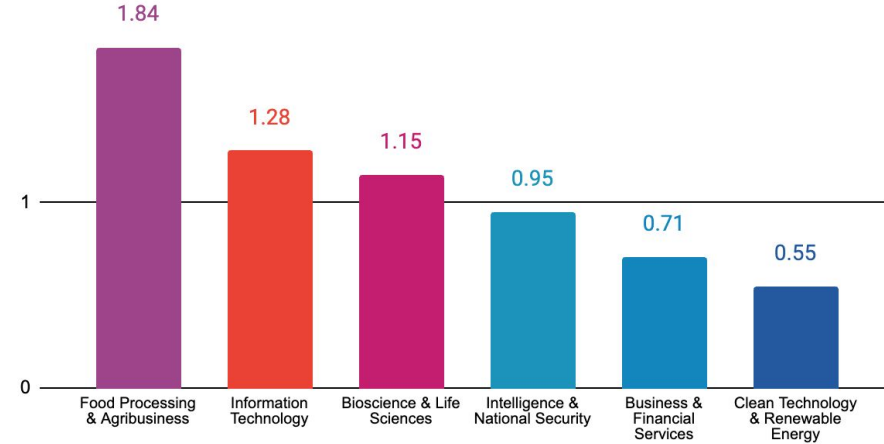
Source: Lightcast

All of the county's target clusters are facing relatively high retirement risks

Share of Workers Age 55+ in 2024, by Cluster

Business & Financial Services	32.1%
Clean Technology & Renewable Energy	29.4%
Food Processing & Agribusiness	28.9%
Intelligence & National Security	26.0%
Bioscience & Life Sciences	24.6%
Information Technology	21.6%
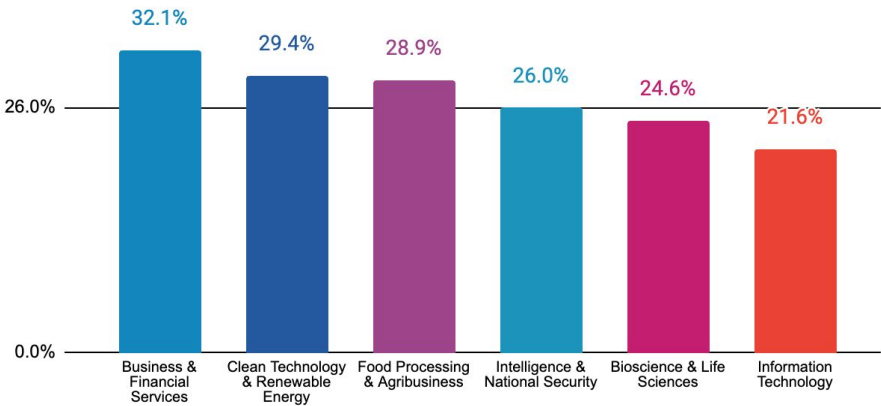
Source: Lightcast

LQ - Share of Workers Age 55+ in 2024 vs the U.S., by Cluster

Information Technology	1.31
Intelligence & National Security	1.26
Business & Financial Services	1.22
Clean Technology & Renewable Energy	1.2
Bioscience & Life Sciences	1.07
Food Processing & Agribusiness	0.9
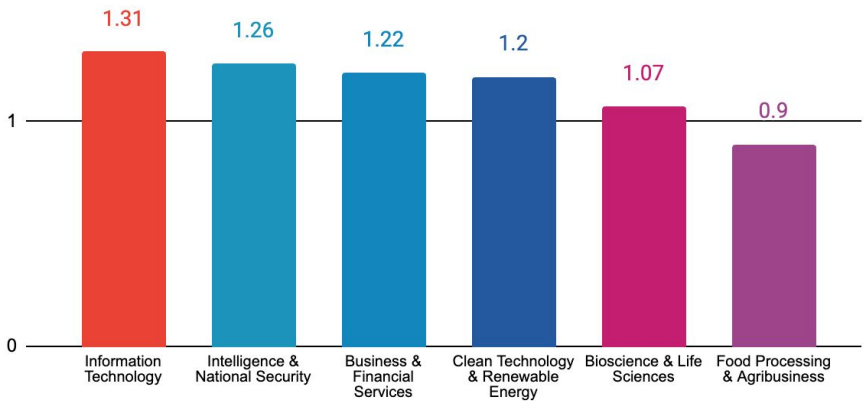
Source: Lightcast

Note: 26% is the share of the county's workforce age 55+

resonance

Business and Financial Services is the only cluster that has a lower share of workers with a Bachelor's Degree or higher relative to the national average

Share of Workers with a Bachelor's Degree or Above in 2024, by Cluster

- Intelligence & National Security: 61.2%
- Information Technology: 59.5%
- Bioscience & Life Sciences: 54.7%
- Business & Financial Services: 43.8%
- Food Processing & Agribusiness: 41.6%
- Clean Technology & Renewable Energy: 30.6%
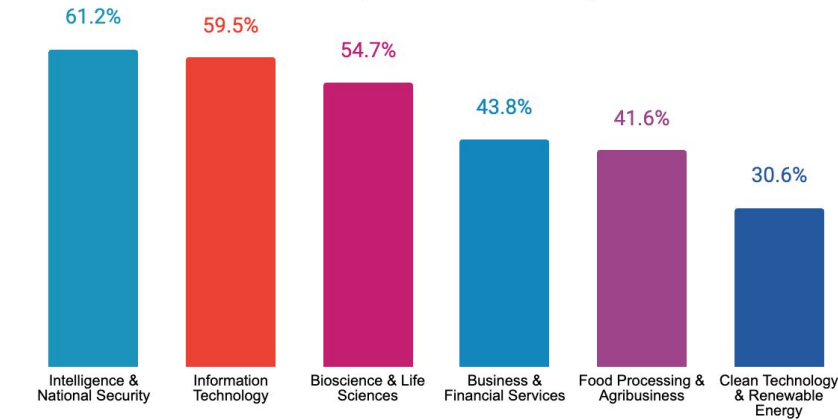
Source: Lightcast

LQ - Share of Workers with BA or Above vs the U.S., by Cluster

- Food Processing & Agribusiness: 1.36
- Intelligence & National Security: 1.2
- Clean Technology & Renewable Energy: 1.16
- Bioscience & Life Sciences: 1.12
- Information Technology: 1.09
- Business & Financial Services: 0.97
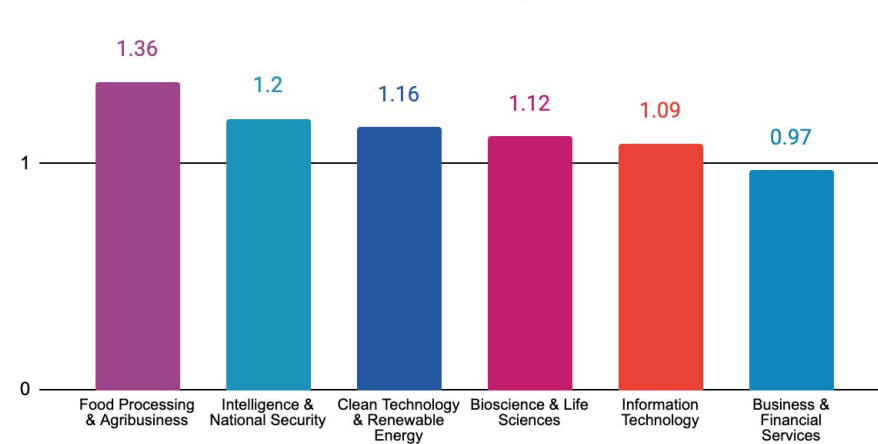
Source: Lightcast

Wages for Information Technology occupations are the highest, but occupations in most clusters earn slightly less than the national average

Median Annual Earnings for Occupations in Cluster, 2023
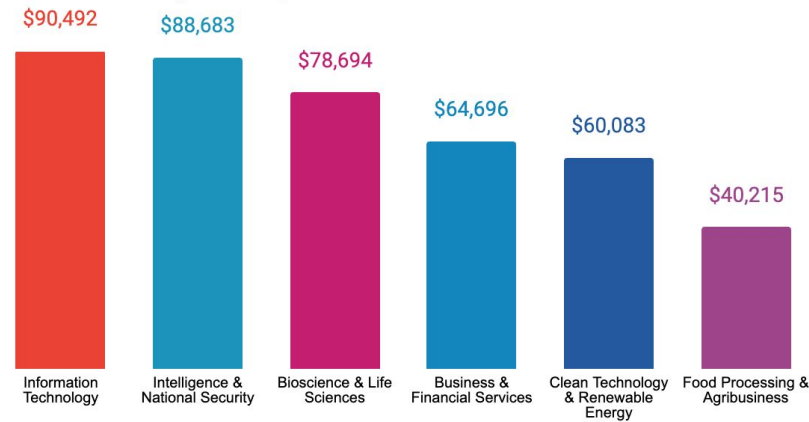
Source: Lightcast

LQ - Median Annual Earnings for Occupations in Cluster vs the U.S., 2023
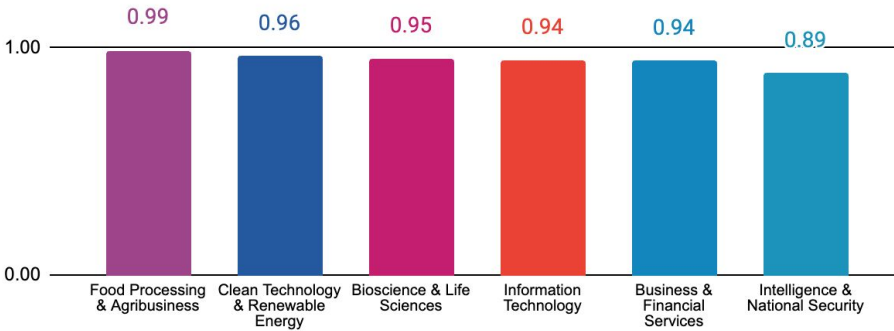
Source: Lightcast

The Bioscience and Life Sciences cluster has around 1 in 10 jobs at risk of automation.

Share of Jobs within each Cluster at Risk of Automation (Automation Index > 100)
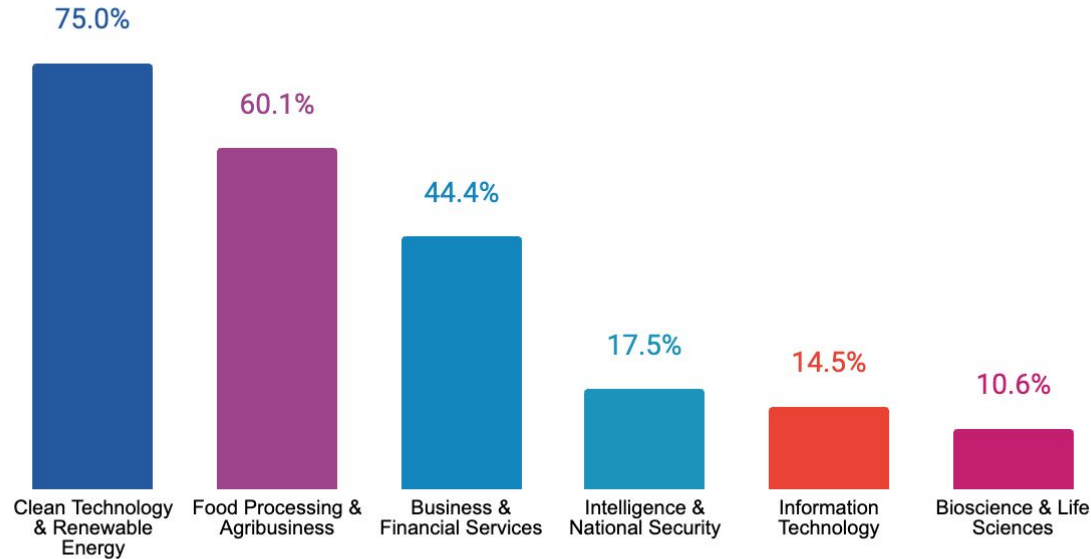
Source: Lightcast

Resilience

Cluster Description	Number of industries in cluster	Demand met in-region	Workforce age 55+ (%)	LQ - Age 55+	BA or above (%)	LQ - BA or above (%)	Median Wages	LQ - Median Wages	% Jobs at Risk of Automation
Bioscience & Life Sciences	4	59.5%	24.6%	1.07	54.7%	1.12	$78,694	0.95	10.6%
Business & Financial Services	4	51.6%	32.1%	1.22	43.8%	0.97	$64,696	0.94	44.4%
Clean Technology & Renewable Energy	5	41.8%	29.4%	1.2	30.6%	1.16	$60,083	0.96	75.0%
Intelligence & National Security	3	76.2%	26.0%	1.26	61.2%	1.2	$88,683	0.89	17.5%
Information Technology	3	69.1%	21.6%	1.31	59.5%	1.09	$90,492	0.94	14.5%
Food Processing & Agribusiness	6	52.8%	28.9%	0.9	41.6%	1.36	$40,215	0.99	60.1%

04
Target Industry Profiles

Target Industry Profiles

01 - Bioscience and Life Sciences

02 - Business and Financial Services

03 - Clean Technology and Renewable Energy

04 - Intelligence and National Security

05 - Information Technology

06 - Food Processing and Agribusiness

01

Bioscience and Life Sciences

Overall LQ: 1.76
Total Employment: 1,175
Average Industry Earnings per Job: $113,907

Cluster Assets

- North Fork Discovery Park

- Proximity to UVA

- Contributes the most to the regional economy ($269 million)

- Lowest risk of automation (11% of jobs)

Bioscience and Life Sciences

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	GRP (Millions)
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	760	-103	-11.9%	64.7%	3.20	$123,050	$120
541990	All Other Professional, Scientific, and Technical Services	165	46	38.7%	14.0%	1.11	$73,404	$50
621511	Medical Laboratories	86	-6	-6.5%	7.3%	0.84	$96,978	$14
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	63	62	6200.0%	5.3%	3.93	$90,878	$9
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	46	3	7.0%	3.9%	1.41	$78,178	$10
424210	Drugs and Druggists' Sundries Merchant Wholesalers	40	32	400.0%	3.4%	0.36	$234,478	$62
334516	Analytical Laboratory Instrument Manufacturing	16	16	N/A	1.3%	0.80	$76,085	$2
ABCV01	**Bioscience & Life Sciences**	**1,175**	**50**	**4.4%**	**100%**	**1.76**	**$113,907**	**$269**

Although its decreased significantly, Bioscience and Life Sciences has maintained a competitive advantage in employment relative to the Commonwealth and nation

LQ for % of Jobs in Cluster Compared to Virginia, by Year
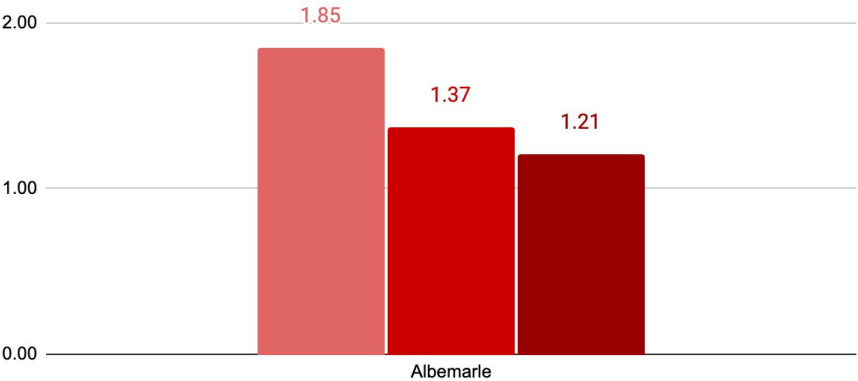
■ 2019   ■ 2024   ■ 2029

Source: Lightcast

LQ for % of Jobs in Cluster Compared to US, by Year

■ 2019   ■ 2024   ■ 2029

Source: Lightcast

resonance
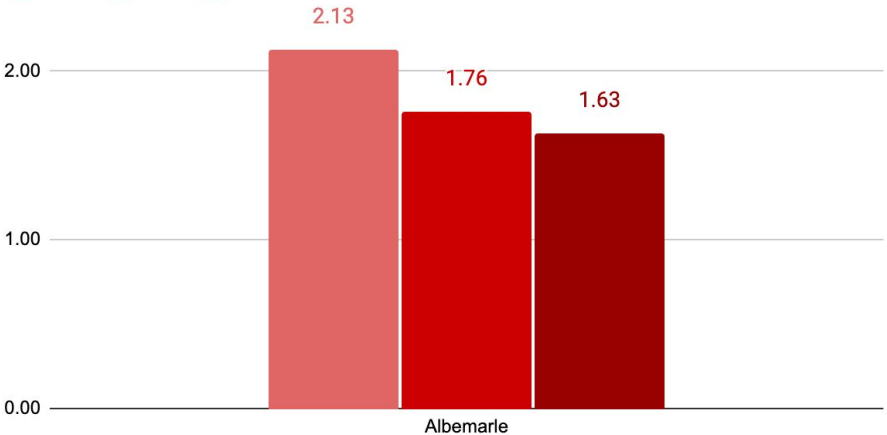
The supply of jobs increased 4% over the past 5 years

Total Employment in Cluster, by Year
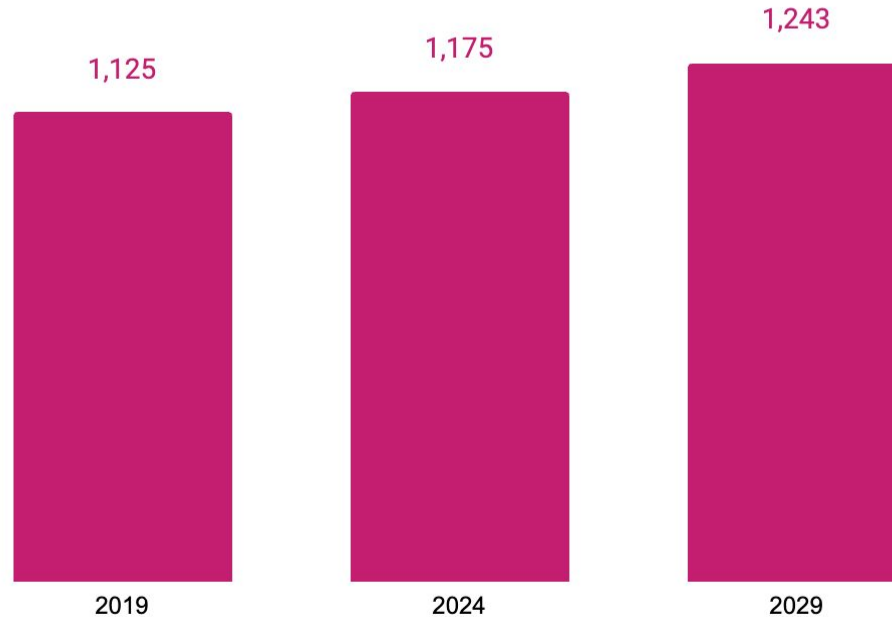
Source: Lightcast

The cluster grew 4 times slower in the county over the past 5 years than compared to the nation overall

Cumulative Growth in Employment since 2019, Scaled by Region Size
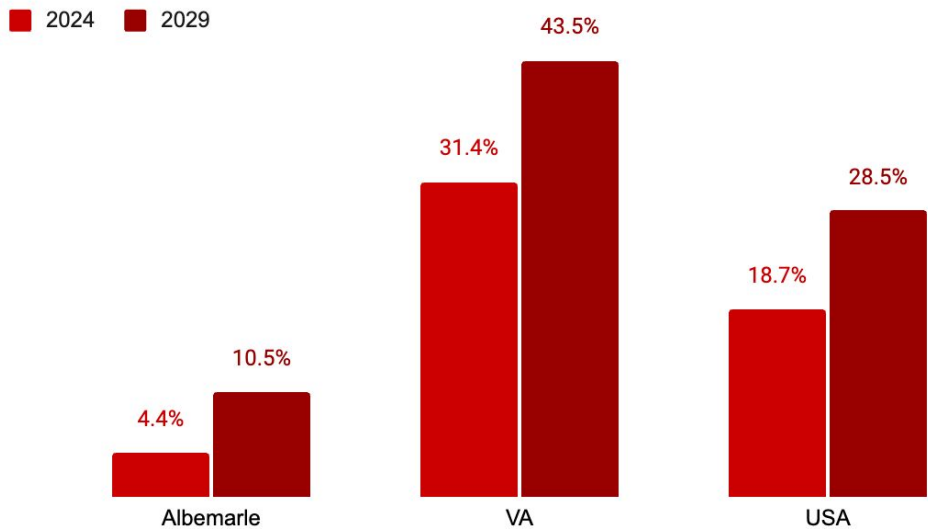
■ 2024　■ 2029

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	4.4%	5.8%	**10.5%**
VA	31.4%	9.2%	**43.5%**
USA	18.7%	8.3%	**28.5%**

Source: Lightcast

Much of the cluster's slower growth was due to a decrease in R&D jobs

5-Year Job Growth by LQ for Industries in Cluster
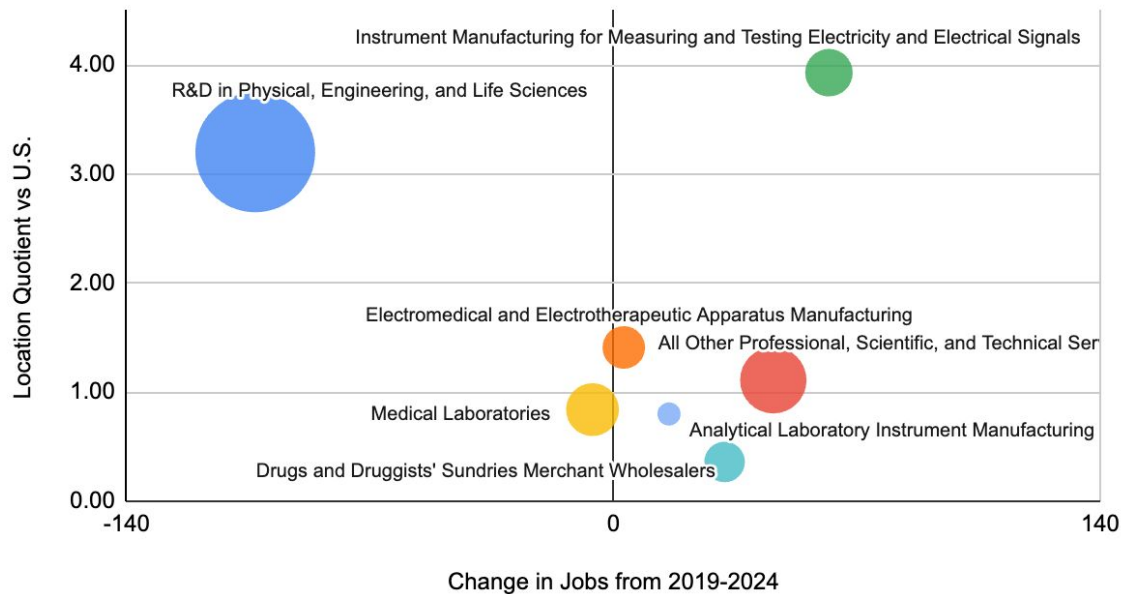
Note: Size of each bubble is based on the size of employment in 2024.

That slower growth is attributed to a negative competitive effect over the past 5 years

Composition of Expected Change in Jobs from 2019-2024
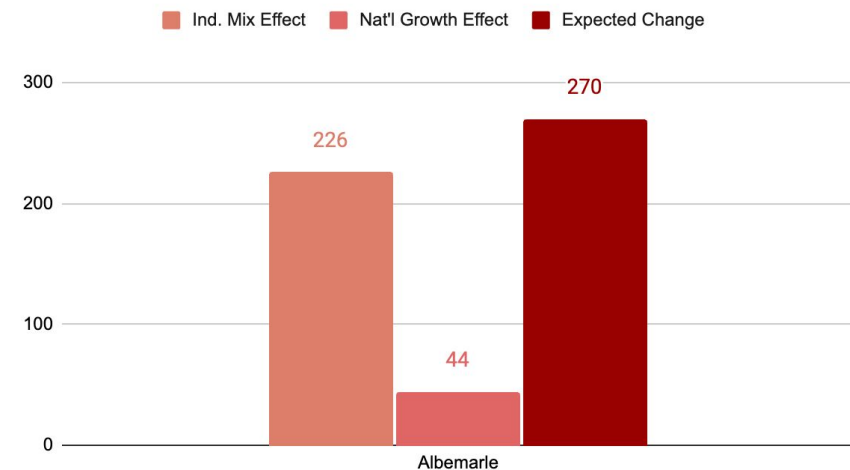
Expected vs Actual Change in Jobs from 2019-2024
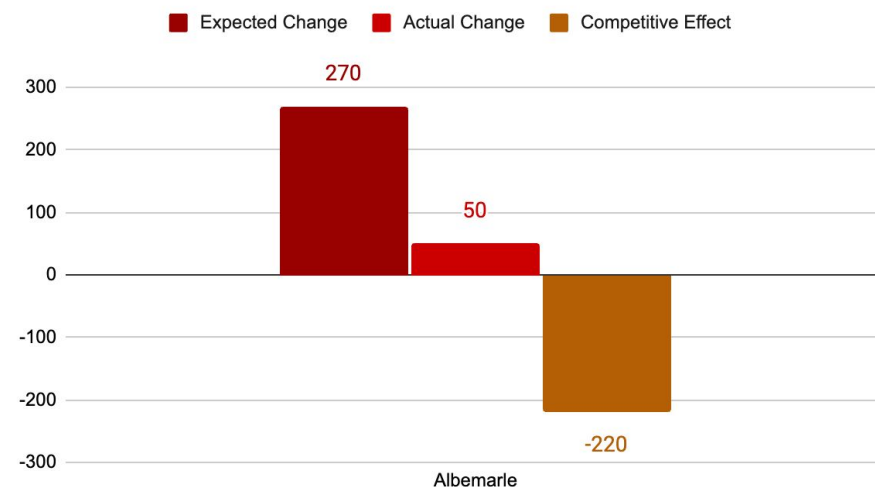
Source: Lightcast

Source: Lightcast

The cluster's Gross Regional Product (GRP) has nearly doubled over the past decade - a similar trend compared to the Commonwealth and the nation

Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)
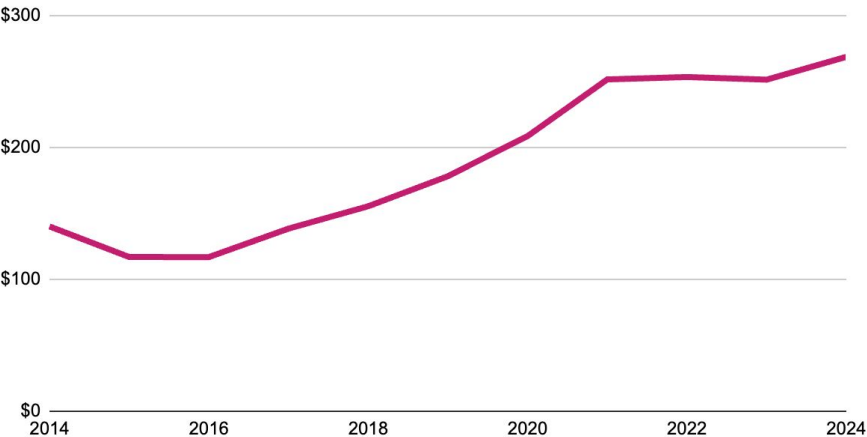
Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

Albemarle — VA — USA
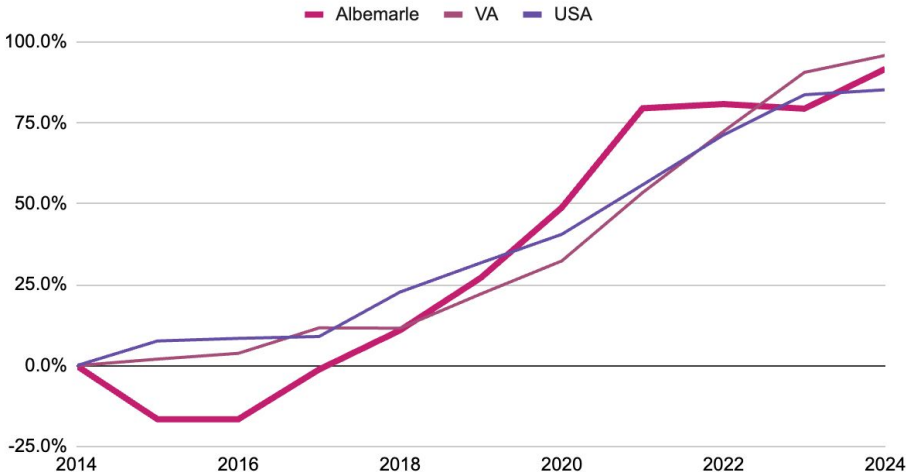
Source: Lightcast

The cluster's GRP per worker grew 44% over the past 5 years, now surpassing that of the Commonwealth

GRP per Worker, by Region and Year
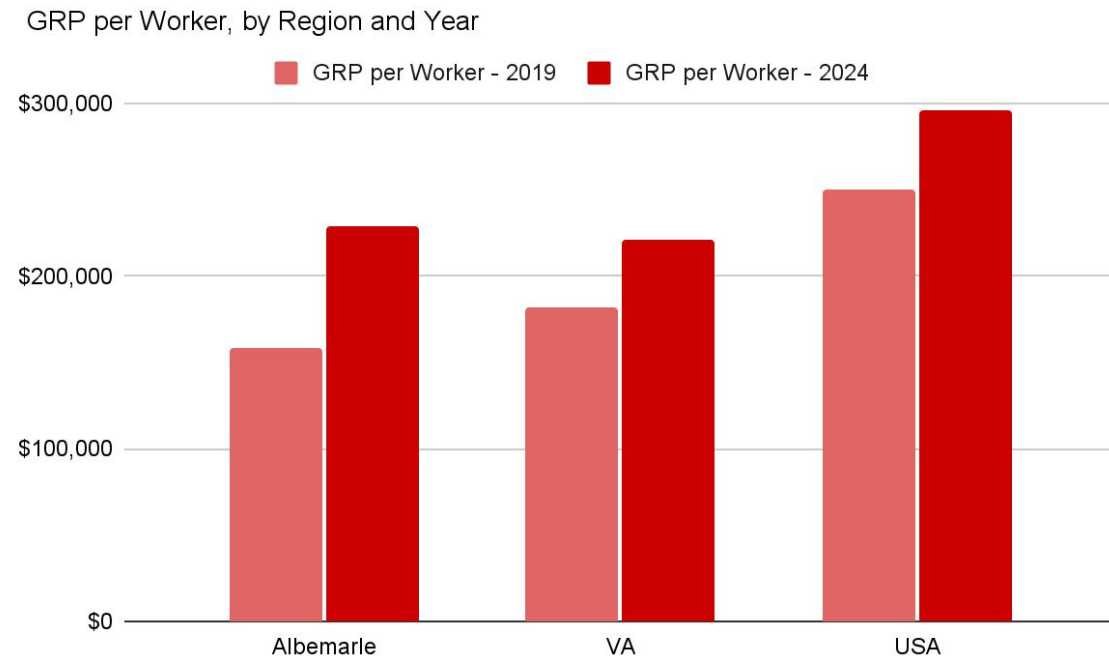
Source: Lightcast

The cluster's economic productivity has surpassed the Commonwealth's but is still behind the national average

Location Quotient for GRP per Worker Compared to Virginia, by Year
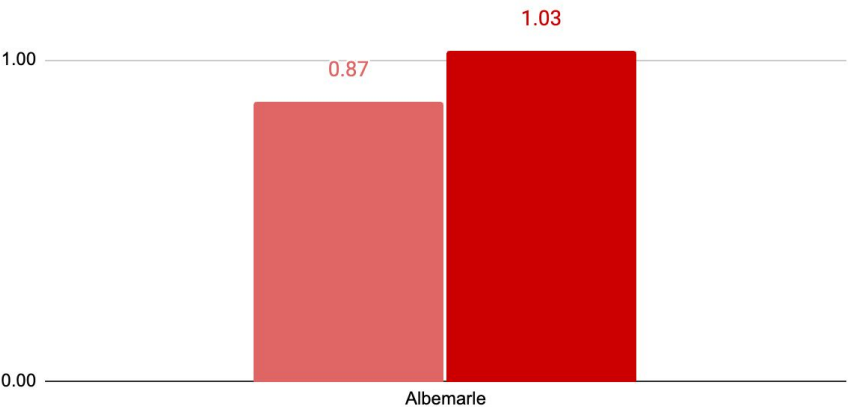
■ 2019   ■ 2024

1.03

0.87

1.00

0.00

Albemarle

Source: Lightcast

Location Quotient for GRP per Worker Compared to the U.S., by Year

■ 2019   ■ 2024

0.77

0.63

1.00

0.00

Albemarle
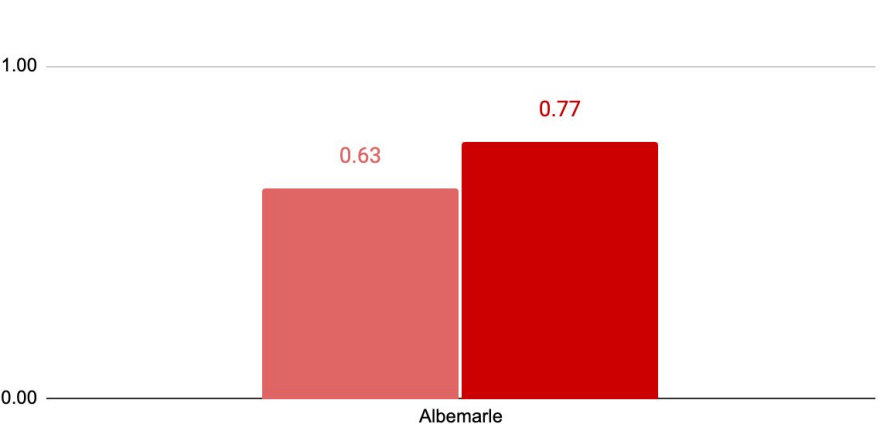
Source: Lightcast

The cluster exports over $6 out of every $10 in sales outside of the region, enhancing its competitiveness

% of Exported Sales in 2024, by Region

65.1%

44.3%

Albemarle

VA

Source: Lightcast

Average industry earnings per job is nearly 20% lower in the region than the Commonwealth

Average Annual Earnings per Job in 2024, by Region
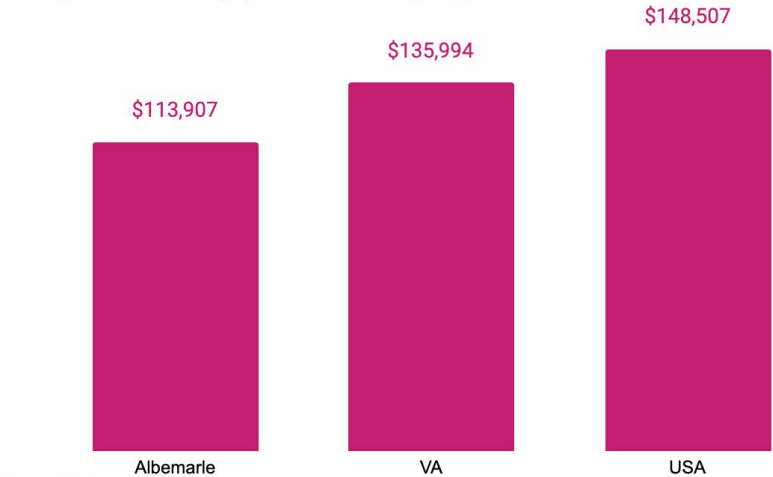
$113,907 — Albemarle
$135,994 — VA
$148,507 — USA

Source: Lightcast

Average Annual Earnings per Job, by Year and Region

Legend: 2019, 2020, 2021, 2022, 2023, 2024

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

resonance

5 out of every 10 workers in the cluster are women - a share that's similar to the national average

Composition of Males and Females in Cluster in 2024, by Region

■ Males   ■ Females

52.4%	51.1%	52.5%
Albemarle	VA	USA
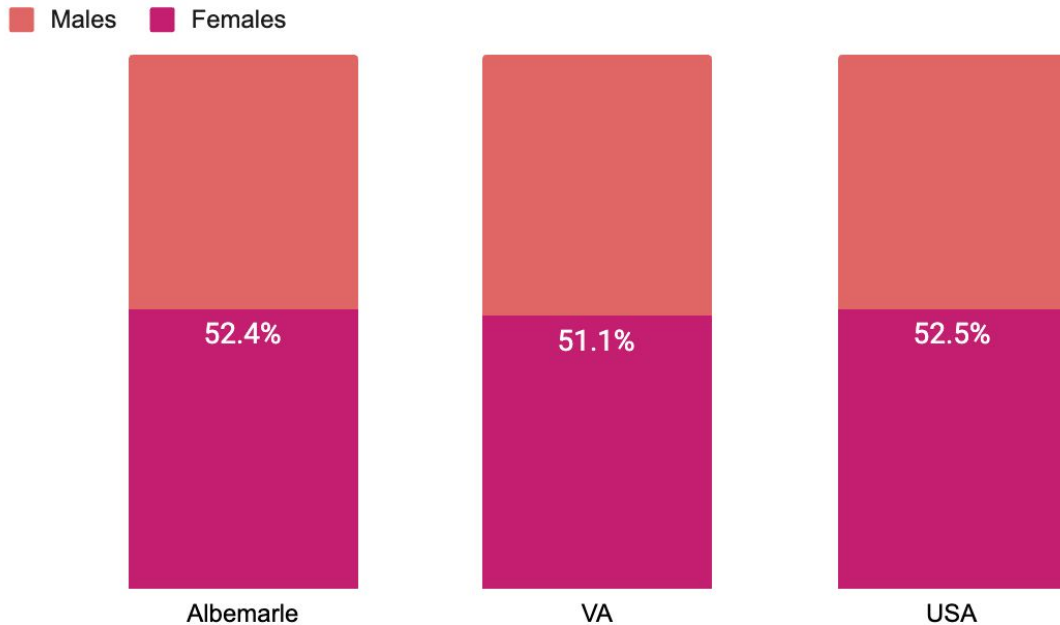
Source: Lightcast

Over 2 out of every 10 workers in the cluster are people of color

Race/Ethnicity Composition of Cluster in 2024

Other
1.9%

Asian
6.3%

Hispanic or Latino
4.8%

Black or African Am…
11.0%
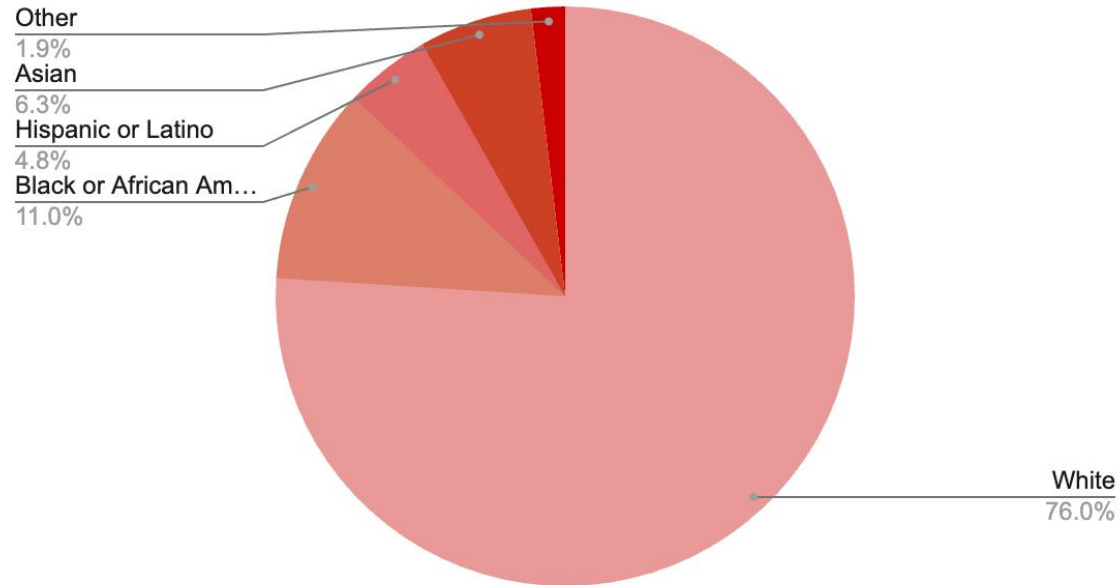
White
76.0%

While the cluster has a lower share of non-white individuals relative to the national average, the cluster has a higher share of non-white workers relative to the county overall

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Note: the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.

resonance

With nearly 1 out of every 4 workers aged 55 or older, the cluster faces a relatively high retirement risk

Age Composition of Cluster in 2024

Age 65+
7.1%

Age 55-64
17.4%

Age 45-54
20.8%

Age 22-24
3.6%

Age 25-34
22.6%

Age 35-44
27.3%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA   ■ LQ - Age 55+ compared to US

1.06   1.07

1.00

0.00

Albemarle
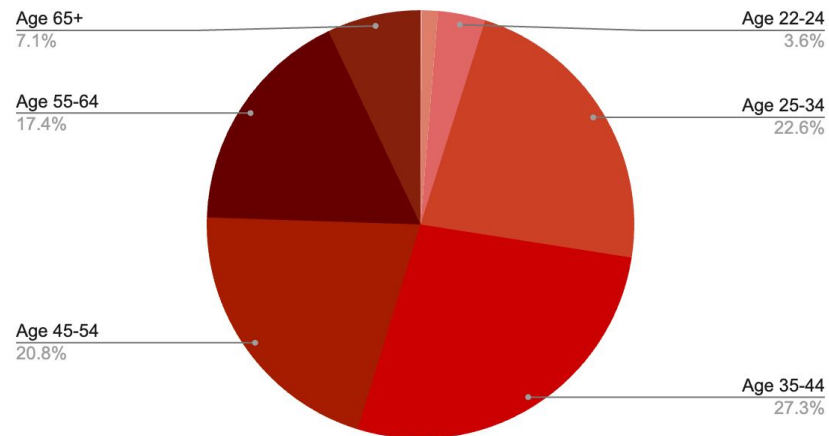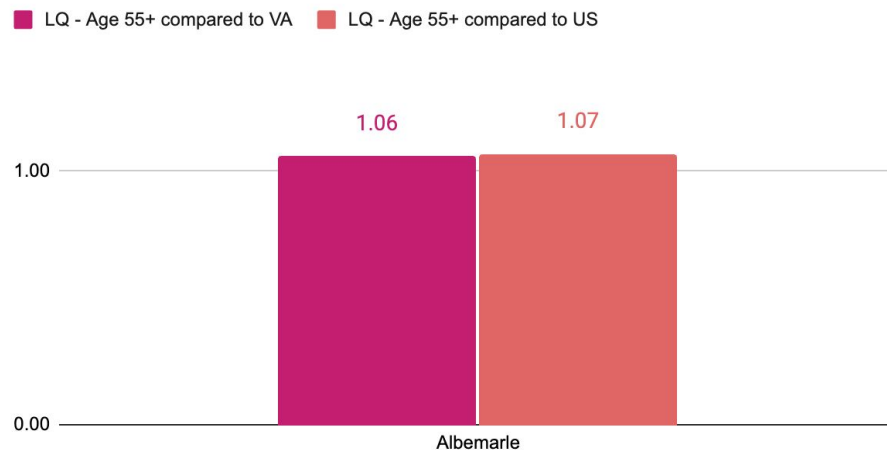
Source: Lightcast

Over 3 out of every 10 workers in the cluster have a Masters or a Doctorate

Education Composition of Cluster in 2024

Doctorate
10.4%

Masters
21.7%

No College Degree
45.3%
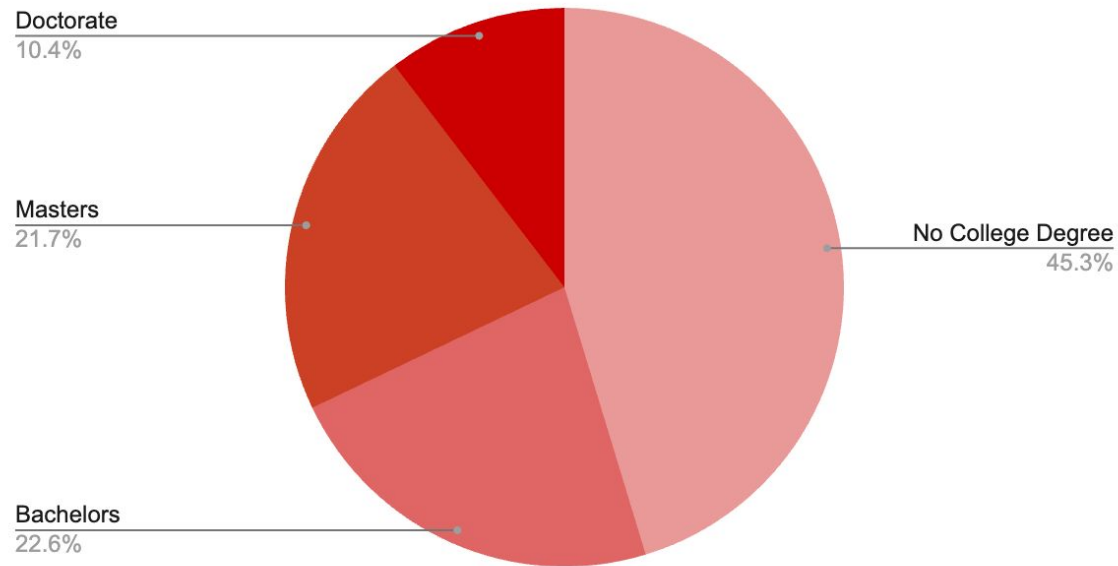
Bachelors
22.6%

With a higher share of workers who have a Bachelors or above as well as those with a Masters or above, the cluster's educational attainment is a competitive advantage

Location Quotients of Cluster Educational Attainment, 2024
■ LQ - BA and above - VA   ■ LQ - BA and above - US

1.06   1.12

1.00

0.00
Albemarle

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024
■ LQ - Masters and above - VA   ■ LQ - Masters and above - US

1.38   1.52

1.00

0.00
Albemarle

Source: Lightcast

resonance
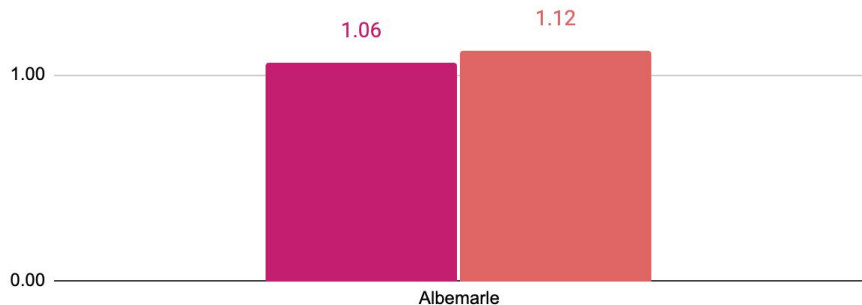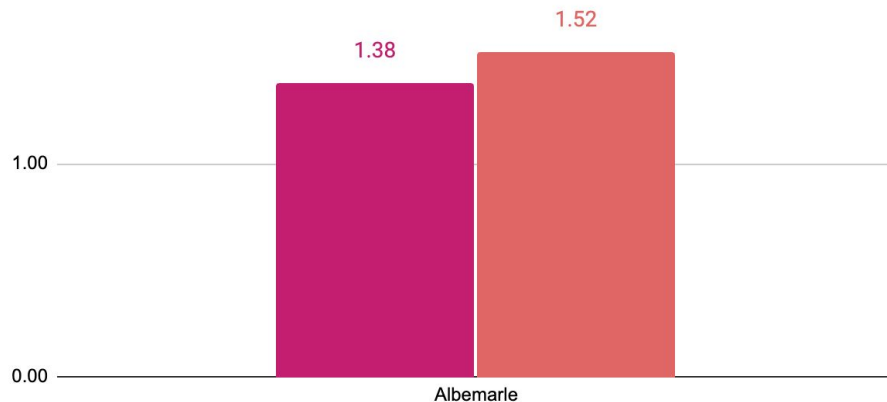
Nearly 60% of the cluster's supply chain requirements are met in the region

% of Demand Met In-Region

Source: Lightcast

Around 1 in every 10 occupations in the cluster are at risk of automation

% of Jobs at Risk of Automation

10.6%

Albemarle

Source: Lightcast

Median earnings for occupations in the cluster are nearly 16% lower than the Commonwealth

Median Annual Earnings in 2023, by Region
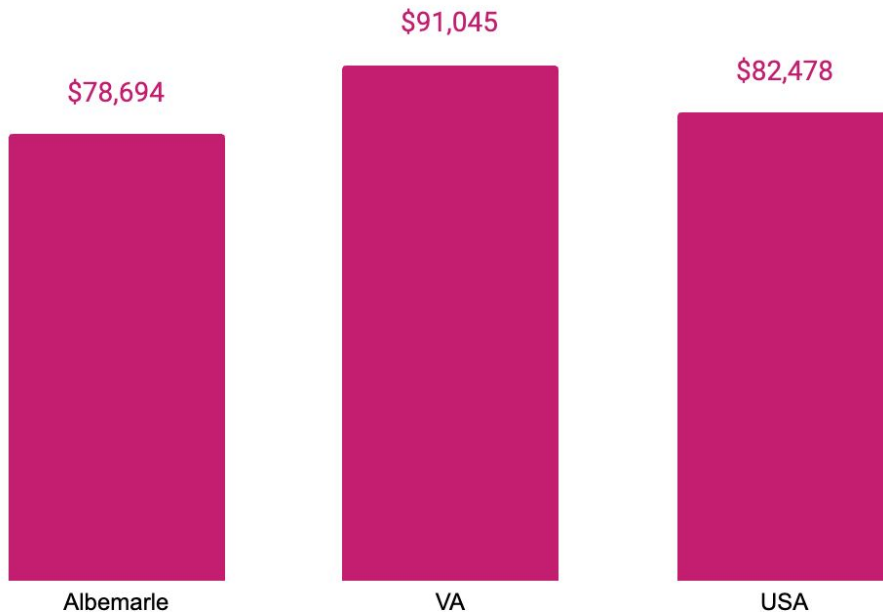
Source: Lightcast

Median earnings for occupations in the cluster grew 9% over the past 5 years, compared to 16% growth for the Commonwealth and 17% for the nation

Median Annual Earnings, by Year and Region
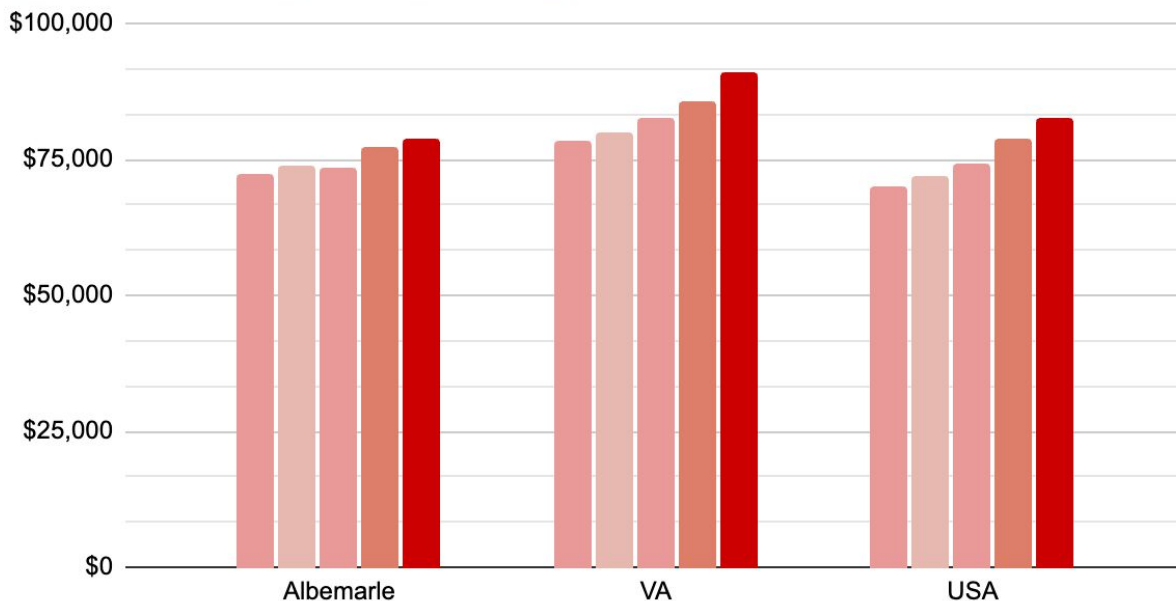
Source: Lightcast

02

Business and Financial Services

Overall LQ: 0.73
Total Employment: 1,065
Average Industry Earnings per Job: $79,762

Cluster Assets

- Potential with regional activity centers

- Highest share of non-white workers (32%)

- Fastest job growth relative to the state (4% faster)

Business and Financial Services

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	GRP (Millions)
561730	Landscaping Services	477	9	1.9%	44.8%	0.88	$44,884	$28.5
541611	Administrative Management and General Management Consulting Services	375	77	25.8%	35.2%	0.88	$110,895	$84.0
541613	Marketing Consulting Services	95	26	37.7%	8.9%	0.55	$103,356	$15.1
611430	Professional and Management Development Training	82	10	13.9%	7.7%	3.35	$89,676	$14.4
524126	Direct Property and Casualty Insurance Carriers	22	-3	-12.0%	2.1%	0.10	$155,022	$10.2
541612	Human Resources Consulting Services	10	-9	-47.4%	1.0%	0.22	$112,781	$1.9
524127	Direct Title Insurance Carriers	3	-14	-82.4%	0.3%	0.10	$46,536	$0.4
524128	Other Direct Insurance (except Life, Health, and Medical) Carriers	1	-53	-98.1%	0.1%	0.12	$77,227	$0.2
ABCV02	**Business & Financial Services**	**1,065**	**45**	**4.4%**	**100%**	**0.73**	**$79,762**	**$154.8**

The share of employment in the cluster is not a competitive advantage for Albemarle

LQ for % of Jobs in Cluster Compared to Virginia, by Year
■ 2019 ■ 2024 ■ 2029
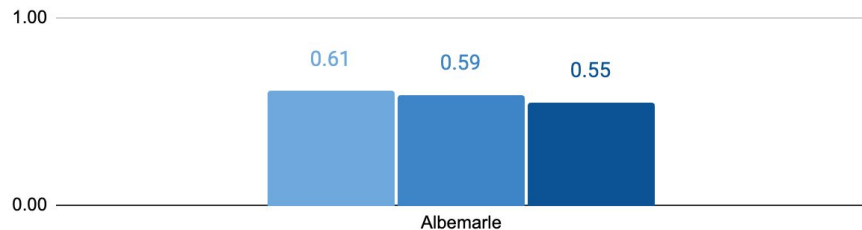
LQ for % of Jobs in Cluster Compared to US, by Year
■ 2019 ■ 2024 ■ 2029
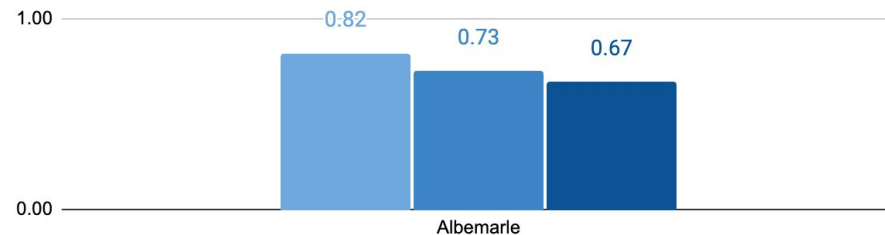
Source: Lightcast

Source: Lightcast

The supply of jobs increased 4% over the past 5 years and is projected to grow 5% in the next 5 years

Total Employment in Cluster, by Year
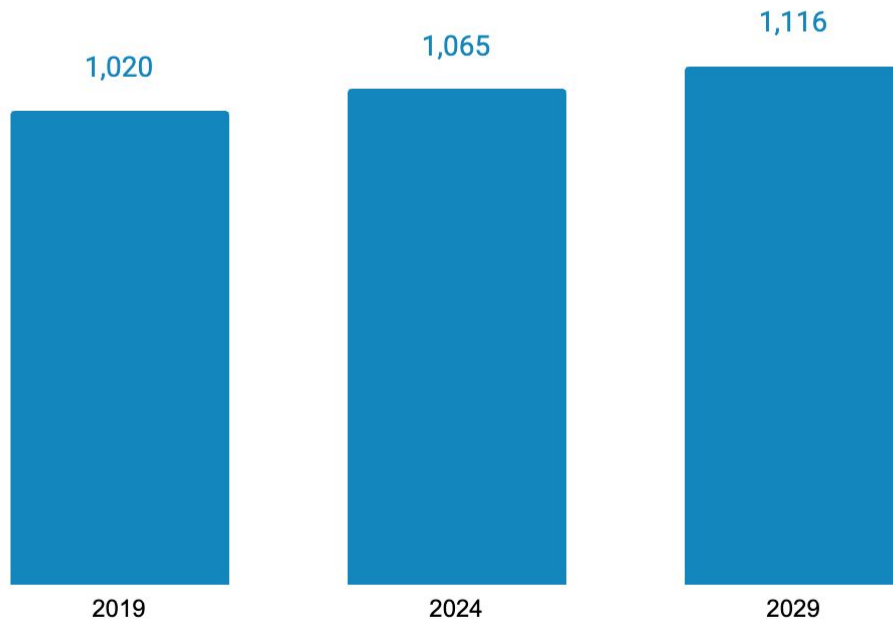
Source: Lightcast

The cluster grew twice as fast at the national level compared to Albemarle over the past 5 years
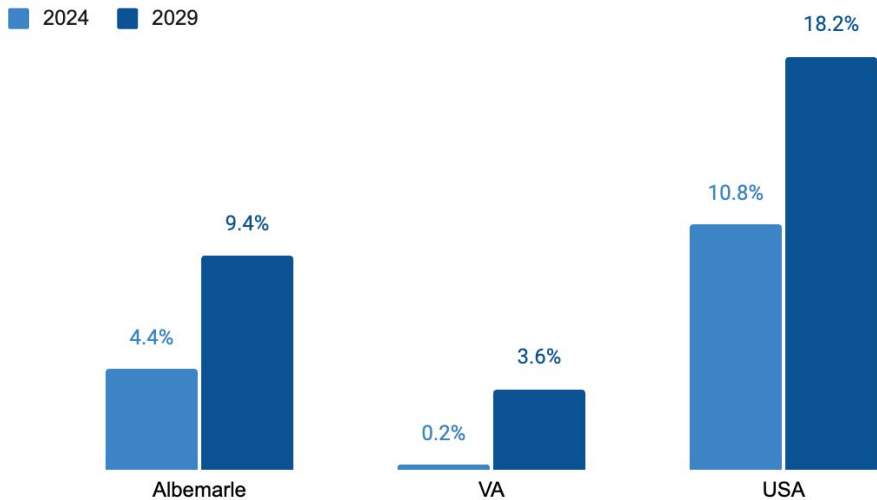
Cumulative Growth in Employment since 2019, Scaled by Region Size

■ 2024 ■ 2029

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	4.4%	4.8%	**9.4%**
VA	0.2%	3.4%	**3.6%**
USA	10.8%	6.7%	**18.2%**

Source: Lightcast

The industries with a lower LQ lost more jobs over the past 5 years
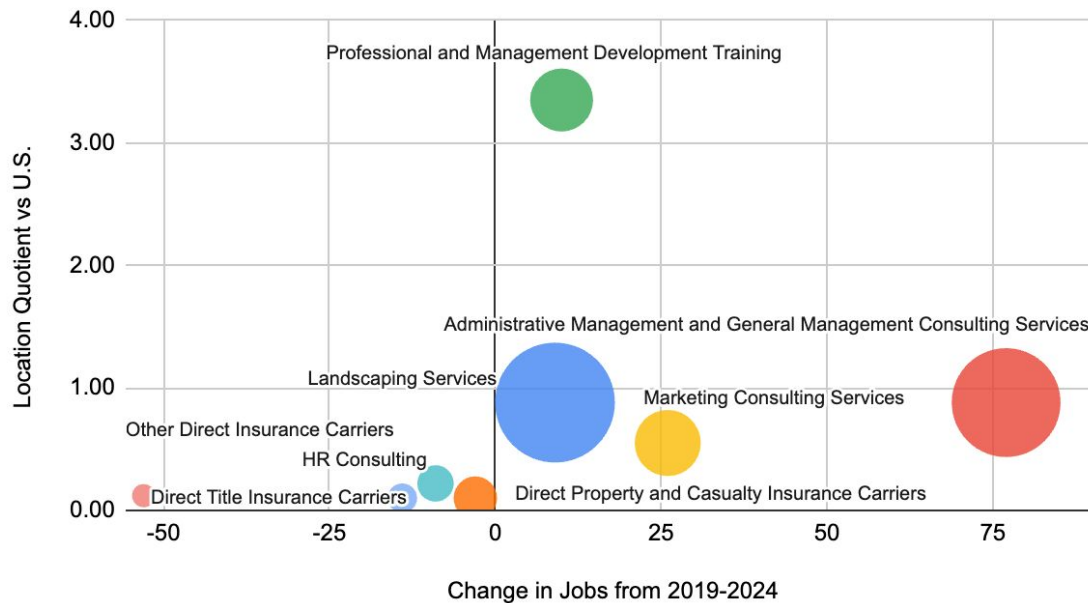
5-Year Job Growth by LQ for Industries in Cluster

Note: Size of each bubble is based on the size of employment in 2024.

That slower growth is attributed to a negative competitive effect over the past 5 years

Composition of Expected Change in Jobs from 2019-2024

■ Ind. Mix Effect ■ Nat'l Growth Effect ■ Expected Change

Source: Lightcast

Expected vs Actual Change in Jobs from 2019-2024

■ Expected Change ■ Actual Change ■ Competitive Effect

Source: Lightcast

resonance
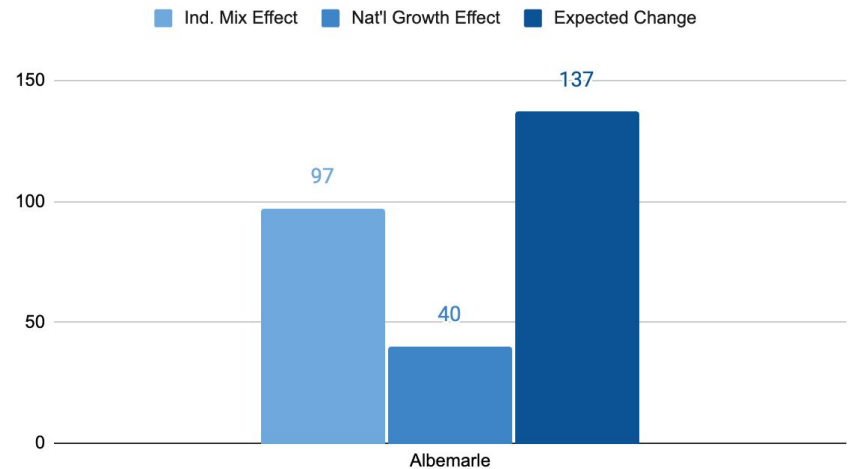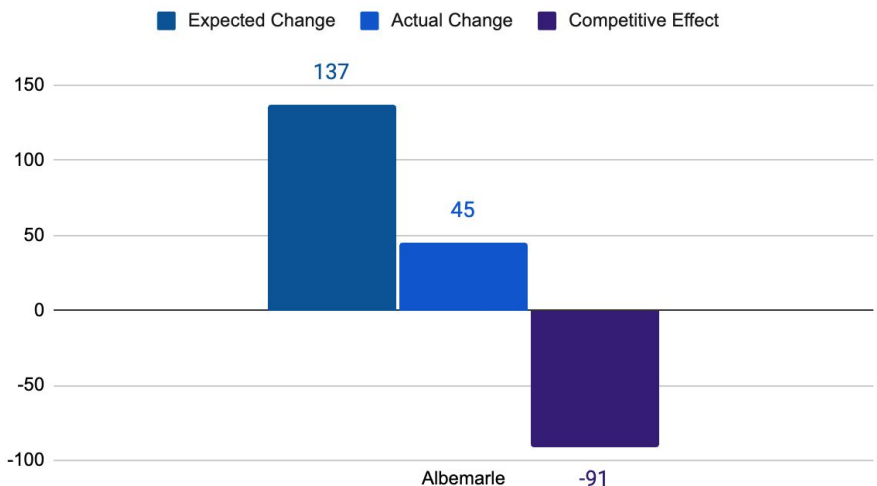
While the cluster's Gross Regional Product (GRP) grew nearly 50% over the past decade, that growth largely occurred from 2017-2021

Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)
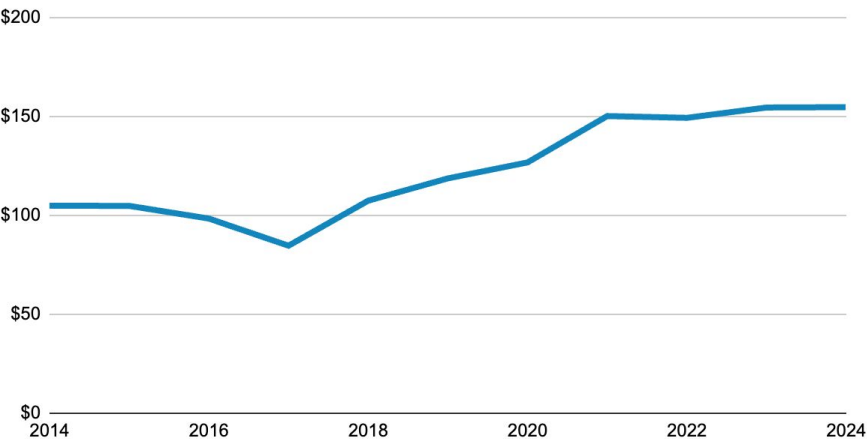
Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

Albemarle   VA   USA
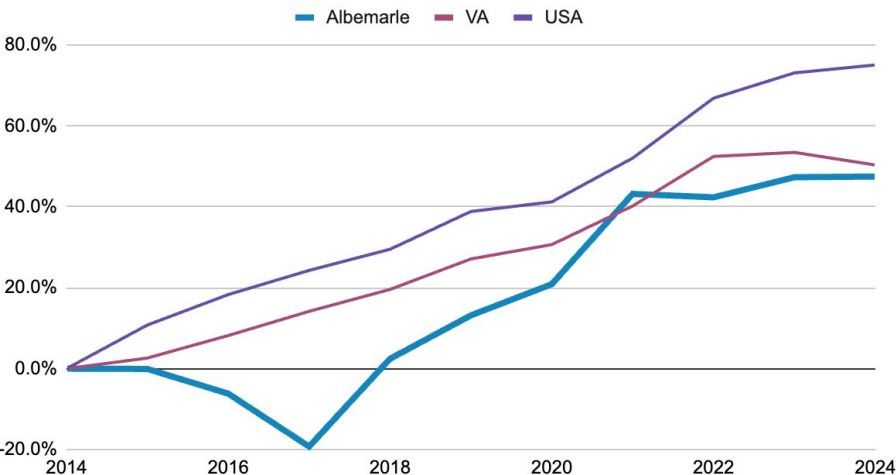
Source: Lightcast

The cluster's GRP per worker grew 25% over the past 5 years

GRP per Worker, by Region and Year

■ GRP per Worker - 2019   ■ GRP per Worker - 2024
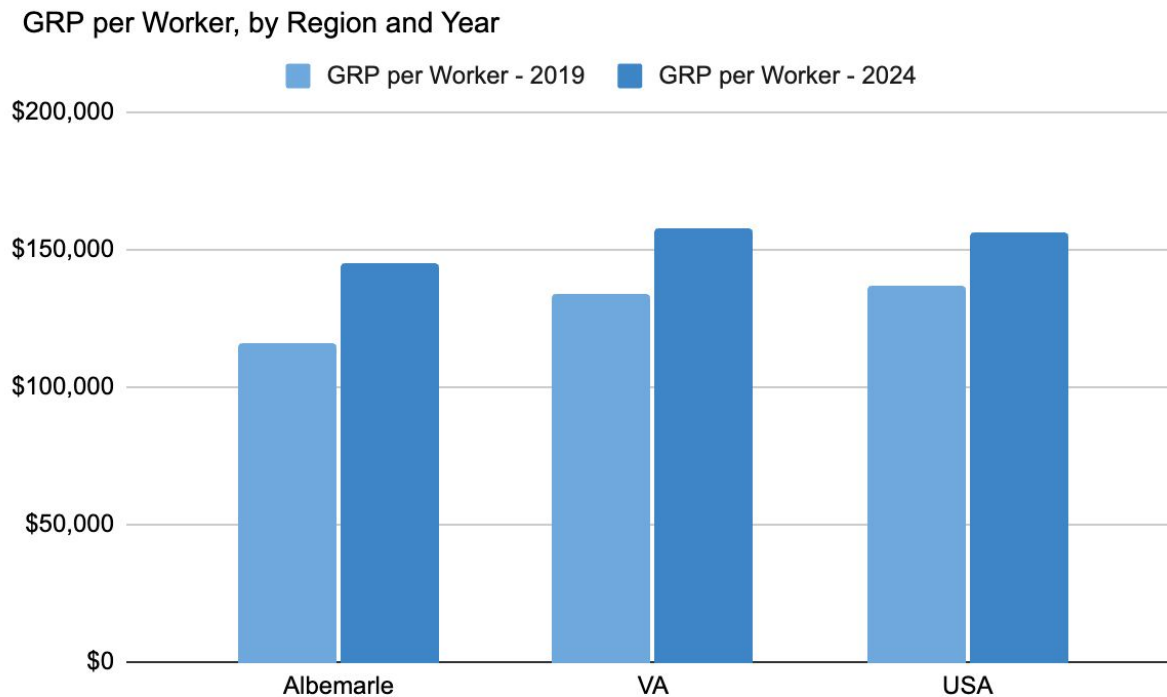
Source: Lightcast

The cluster's GRP per worker is now slightly more competitive with the Commonwealth and nation

Location Quotient for GRP per Worker Compared to Virginia, by Year
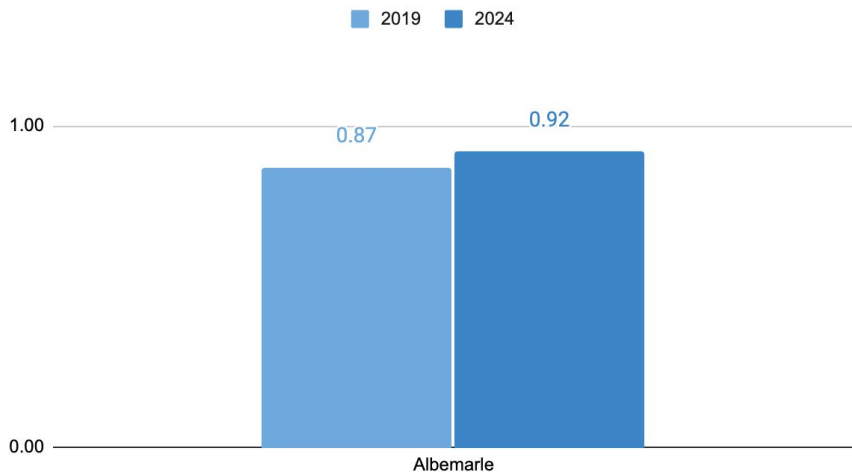
Source: Lightcast

Location Quotient for GRP per Worker Compared to the U.S., by Year

Source: Lightcast

resonance
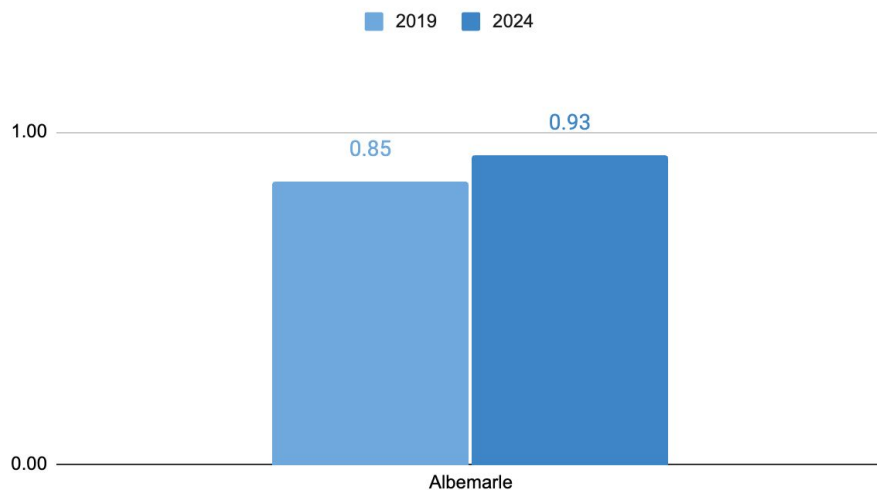
The cluster exports nearly $4 out of every $10 in sales outside of the region - slightly less than the state

% of Exported Sales in 2024, by Region
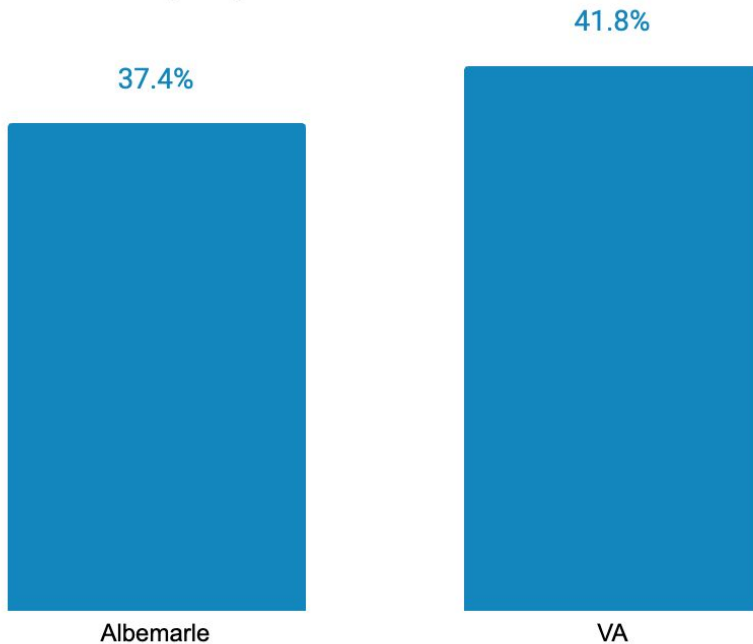
Source: Lightcast

After witnessing a slight decline in 2024, average industry earnings per job is now 46% lower than the Commonwealth and 27% lower than the nation

Average Annual Earnings per Job in 2024, by Region
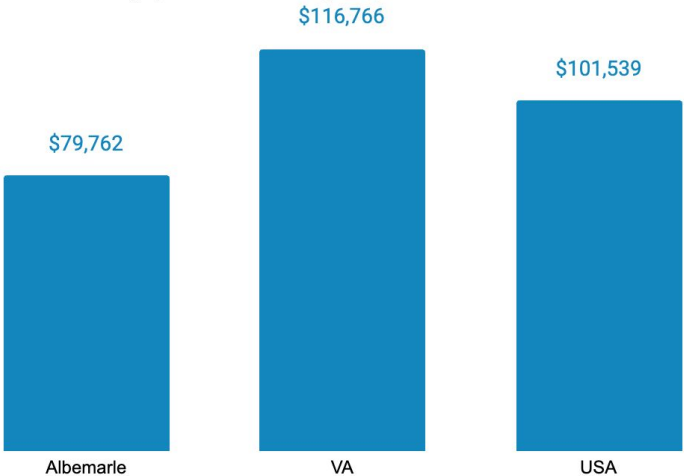
- Albemarle: $79,762
- VA: $116,766
- USA: $101,539

Source: Lightcast

Average Annual Earnings per Job, by Year and Region

2019 2020 2021 2022 2023 2024

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

resonance

The county's cluster has a slightly smaller share of females relative to the state and nation

Composition of Males and Females in Cluster in 2024, by Region

■ Males ■ Females

39.0%	42.3%	42.5%
Albemarle	VA	USA
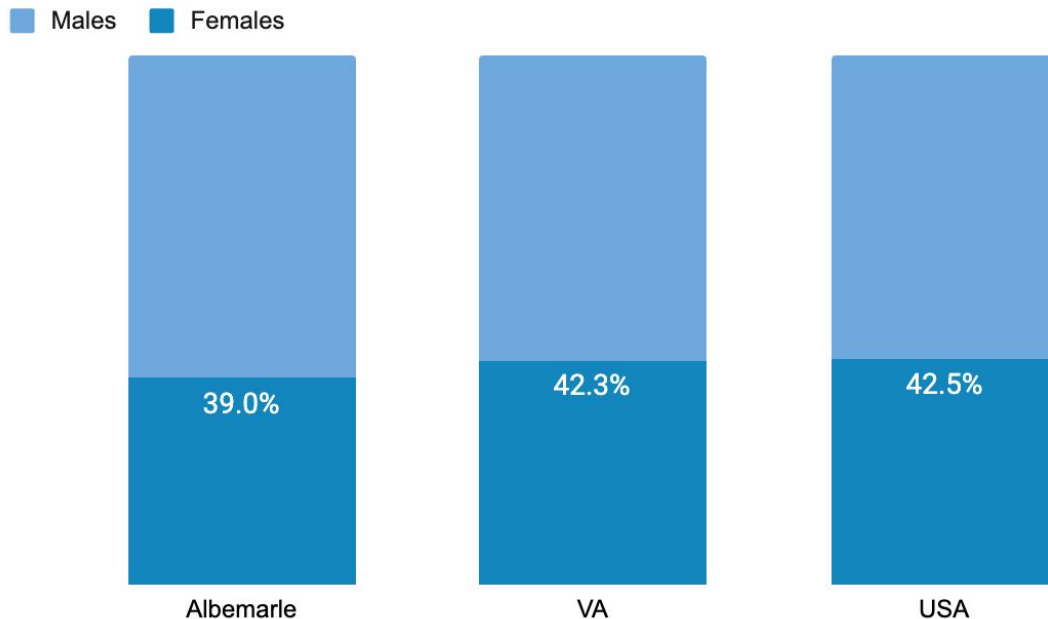
Source: Lightcast

Non-white workers account for 32% of the cluster's workforce - higher than the share of non-white residents in the county overall (26%)

Race/Ethnicity Composition of Cluster in 2024

Asian
3.5%

Hispanic or Latino
12.7%

Black or African Am…
13.3%

White
68.3%
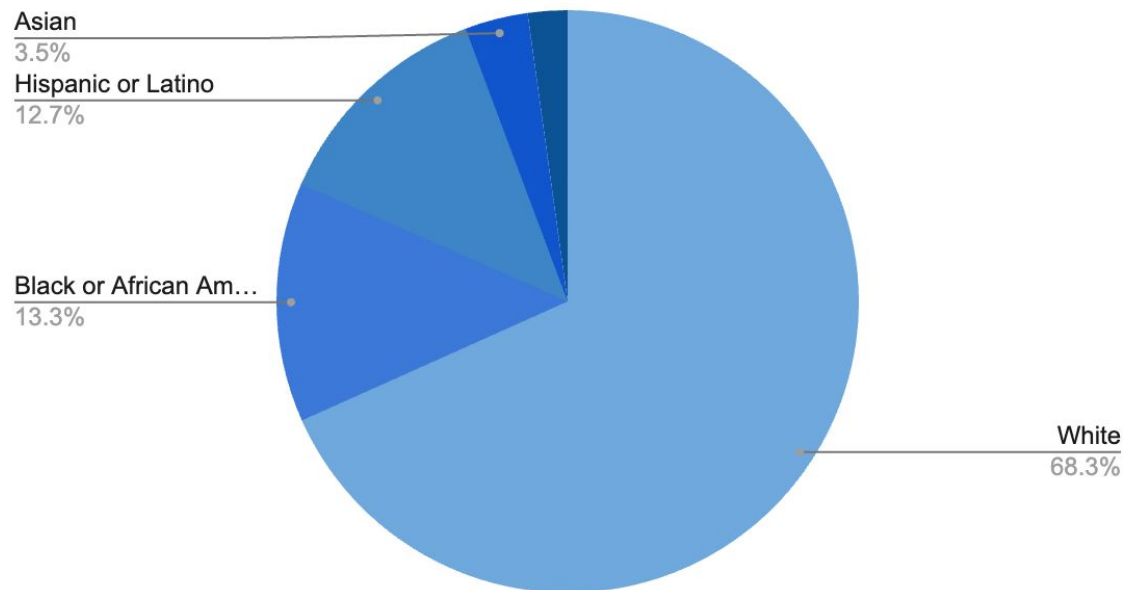
The cluster has a larger share of Black or African Americans and Hispanic or Latinos than the county overall

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce ■ Albemarle Population

Source: Lightcast

Note:the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.

resonance

With over 3 out of 10 workers over the age of 55, the cluster faces a high retirement risk

Age Composition of Cluster in 2024

Age 65+
13.6%

Age 19-21
2.8%

Age 22-24
4.4%

Age 25-34
18.2%

Age 55-64
18.5%

Age 35-44
22.5%

Age 45-54
18.9%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA   ■ LQ - Age 55+ compared to US

1.21   1.22

1.00

0.00

Albemarle
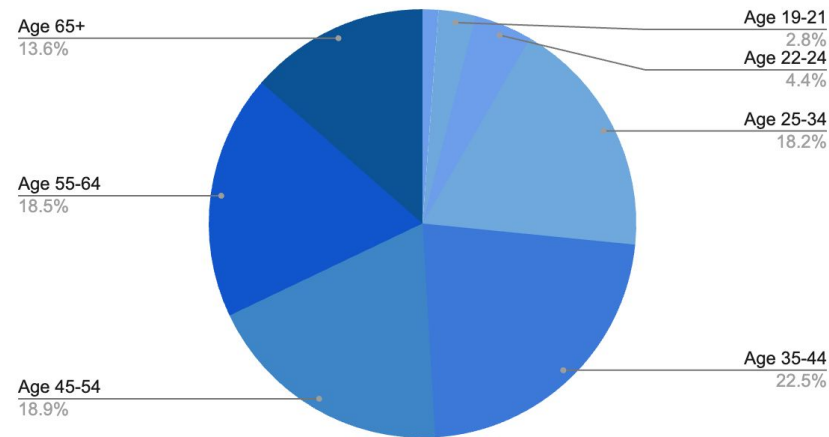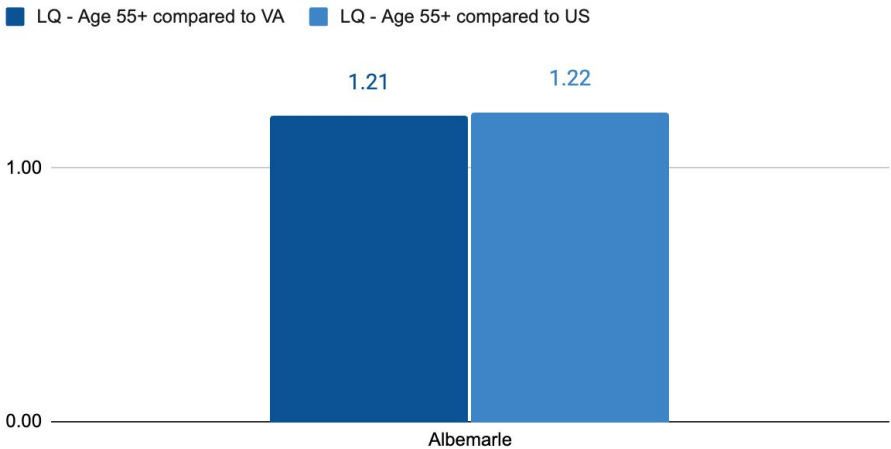
Source: Lightcast

Over 4 out of every 10 workers in the cluster have a Bachelor's Degree or higher

Education Composition of Cluster in 2024

Doctorate
1.9%

Masters
12.9%

Bachelors
29.0%

Associates
2.6%

No College Degree
53.6%
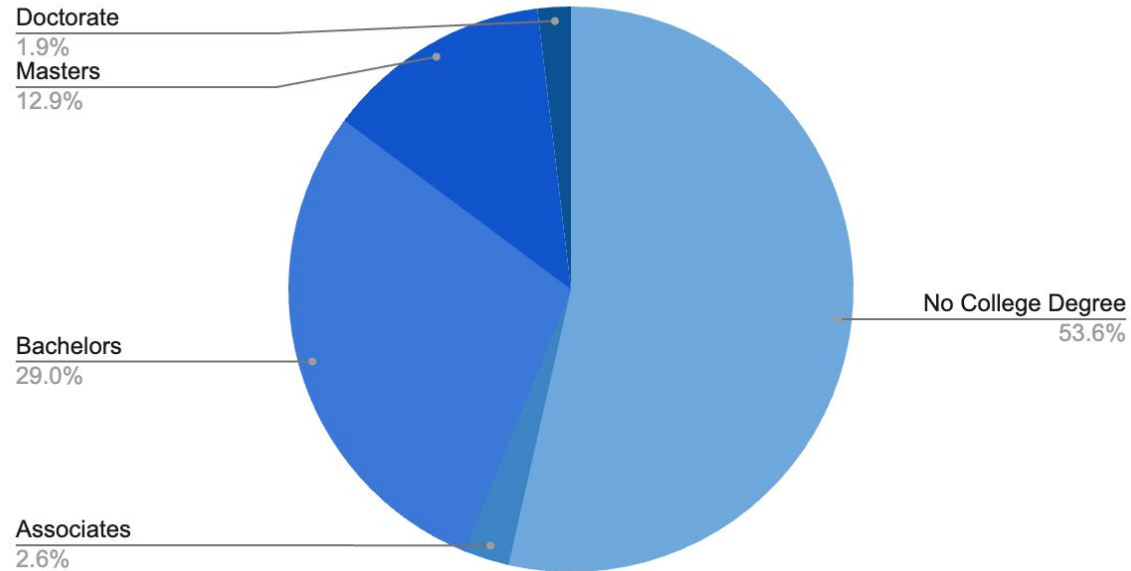
Despite the county's proximity to a major university and a highly educated workforce, the cluster does not have a competitive advantage in educational attainment

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - BA and above - VA ■ LQ - BA and above - US

0.82   0.97

1.00

0.00

Albemarle

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - Masters and above - VA ■ LQ - Masters and above - US

0.64   0.87

1.00

0.00

Albemarle
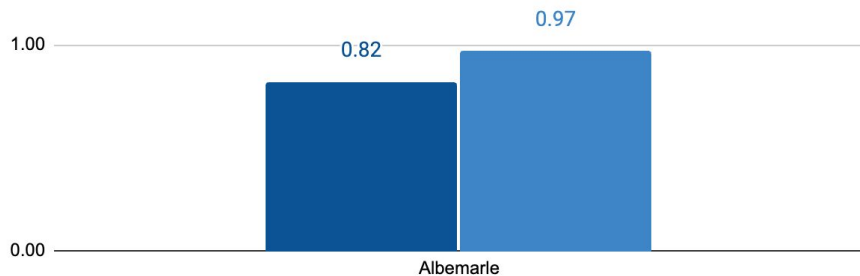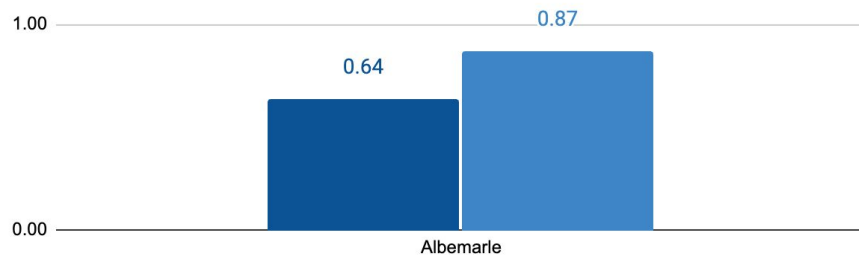
Source: Lightcast

Around 50% of the cluster's supply chain requirements are met in the region - much lower than the state

% of Demand Met In-Region

72.8%

51.6%

Albemarle

VA
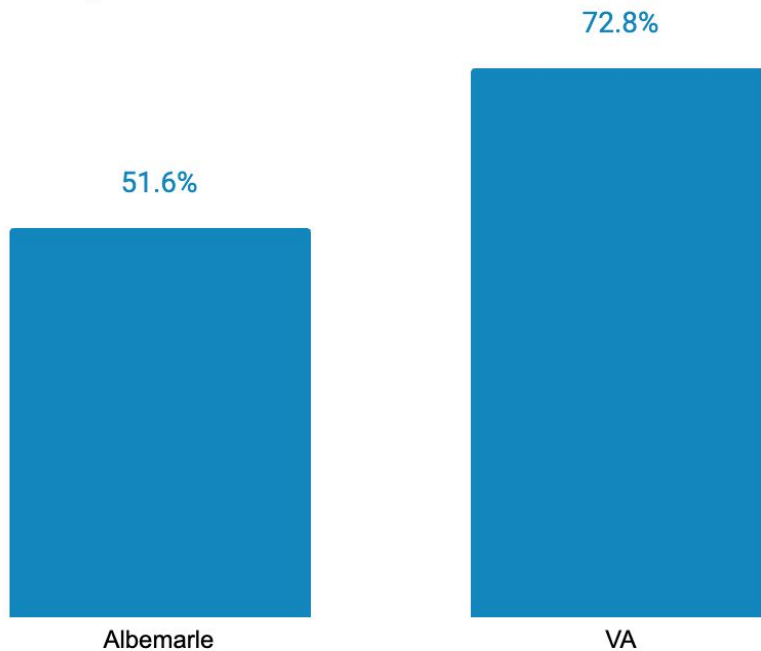
Source: Lightcast

Around 4 in every 10 occupations in the cluster are at risk of automation

% of Jobs at Risk of Automation

44.4%

Albemarle

Source: Lightcast

Median earnings for occupations in the cluster are 28% lower than the Commonwealth and 6% lower than the nation

Median Annual Earnings in 2023, by Region

$64,696 — Albemarle
$82,989 — VA
$68,573 — USA

Source: Lightcast

Median earnings for occupations in the cluster grew 9% over the past 5 years, compared to 16% growth for the Commonwealth and 17% for the nation

Median Annual Earnings, by Year and Region

Legend: 2018, 2019, 2020, 2022, 2023
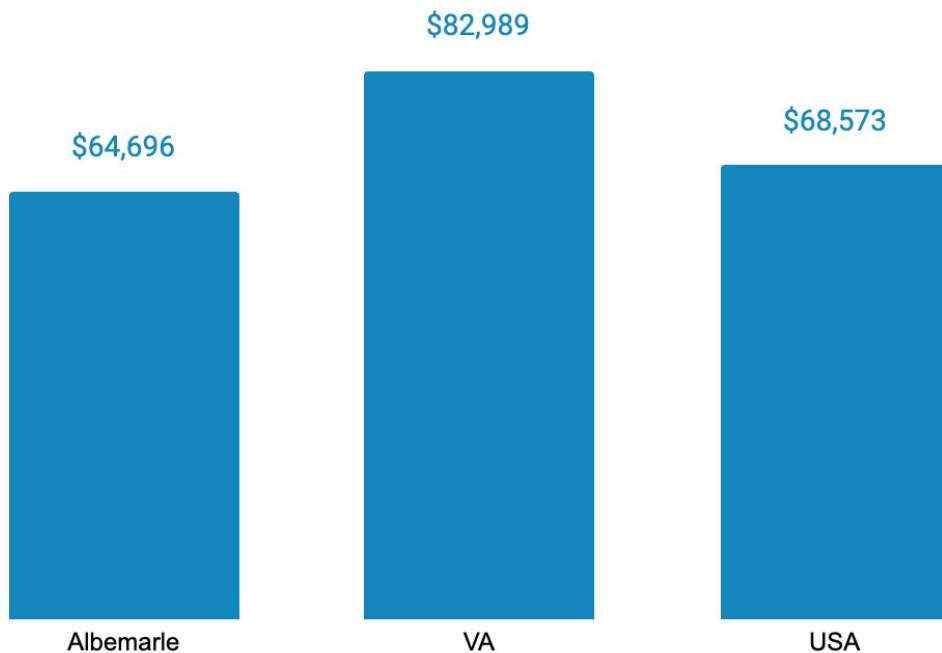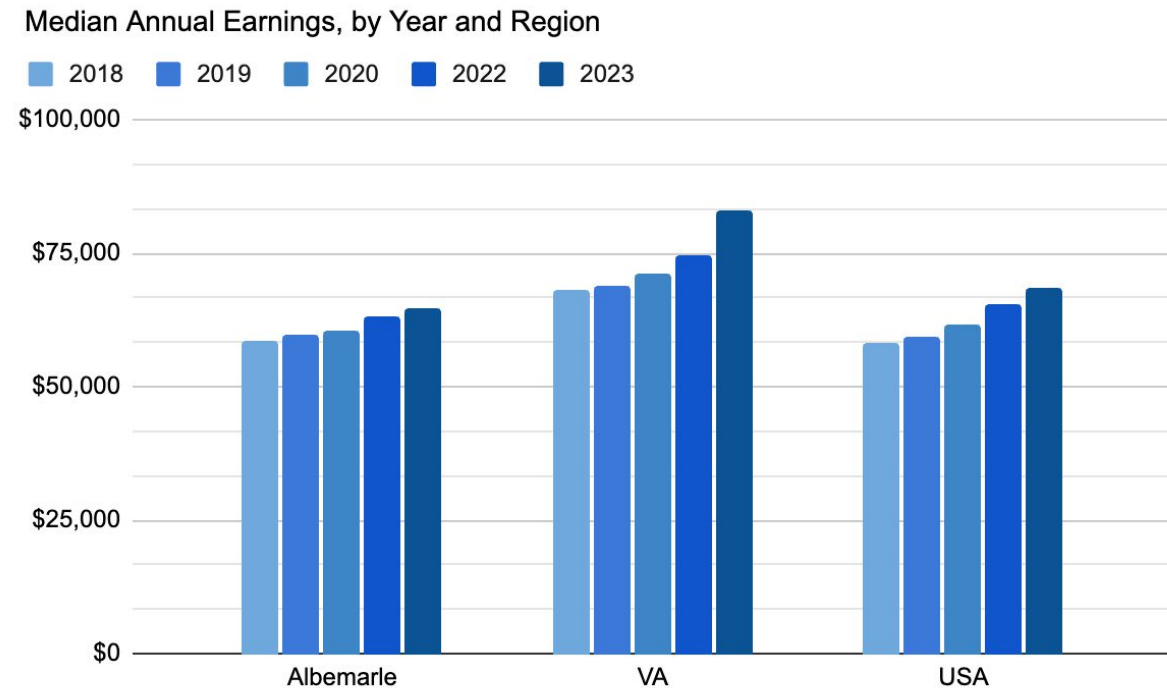
Source: Lightcast

03

Clean Technology and Renewable Energy

Overall LQ: 0.63
Total Employment: 1221
Average Industry Earnings per Job: $88,899

Cluster Assets

- Fastest-growing cluster (10% from 2019-2024)

- Resilient industry base (5 industries)

- Significant employment opportunities for less educated talent (70% workforce without BA)

Clean Technology and Renewable Energy

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	GRP (Millions)
238220	Plumbing, Heating, and Air-Conditioning Contractors	296	-6	-2.0%	24.2%	0.49	$71,170	$31.7
236115	New Single-Family Housing Construction (except For-Sale Builders)	271	18	7.1%	22.2%	1.16	$144,220	$58.3
236118	Residential Remodelers	248	-32	-11.4%	20.3%	0.75	$58,564	$31.8
237120	Oil and Gas Pipeline and Related Structures Construction	99	71	253.6%	8.1%	1.58	$55,166	$7.4
236117	New Housing For-Sale Builders	65	-13	-16.7%	5.3%	1.60	$104,927	$10.3
236220	Commercial and Institutional Building Construction	55	10	22.2%	4.5%	0.16	$84,627	$7.2
236210	Industrial Building Construction	53	26	96.3%	4.3%	0.74	$90,163	$6.6
327120	Clay Building Material and Refractories Manufacturing	44	44	N/A	3.6%	4.57	$95,456	$5.9
236116	New Multifamily Housing Construction	35	14	66.7%	2.9%	1.52	$116,801	$5.8
237130	Power and Communication Line Construction	28	3	12.0%	2.3%	0.26	$43,169	$1.8
237110	Water and Sewer Line and Related Structures Construction	27	-5	-15.6%	2.2%	0.28	$84,986	$2.9
221114	Solar Electric Power Generation	1	1	N/A	0.1%	0.10	$678,557	$2.4
327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	1	-22	-95.7%	0.1%	0.17	$20,150	$0.0
221111	Hydroelectric Power Generation	0	0	N/A	0.0%	0.00	$0	$0.5
221115	Wind Electric Power Generation	0	0	N/A	0.0%	0.00	$0	$0.0
ABCV03	**Clean Technology & Renewable Energy**	**1,221**	**108**	**9.7%**	**100%**	**0.63**	**$88,899**	**$172.7**

resonance

The share of employment in the cluster is not a competitive advantage for Albemarle

LQ for % of Jobs in Cluster Compared to Virginia, by Year

■ 2019 ■ 2024 ■ 2029

1.00

0.69   0.65   0.58

0.00
Albemarle

Source: Lightcast

LQ for % of Jobs in Cluster Compared to US, by Year

■ 2019 ■ 2024 ■ 2029

1.00

0.67   0.63   0.58

0.00
Albemarle

Source: Lightcast

resonance
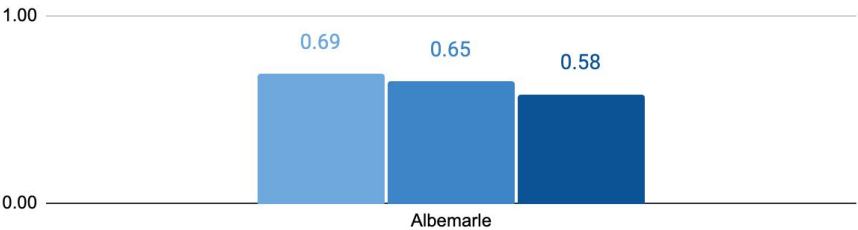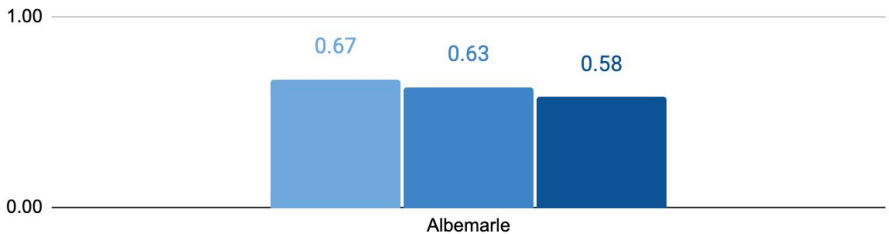
The supply of jobs increased 10% over the past 5 years and is projected to decrease 2% in the next 5 years

Total Employment in Cluster, by Year
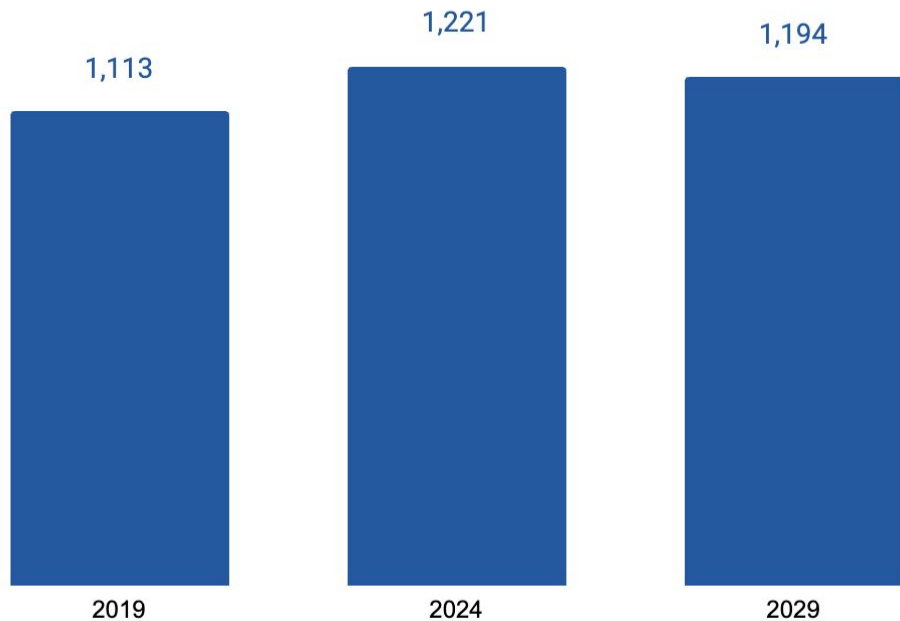
Source: Lightcast

The cluster in the region grew at about the same rate as the Commonwealth and nation

Cumulative Growth in Employment since 2019, Scaled by Region Size
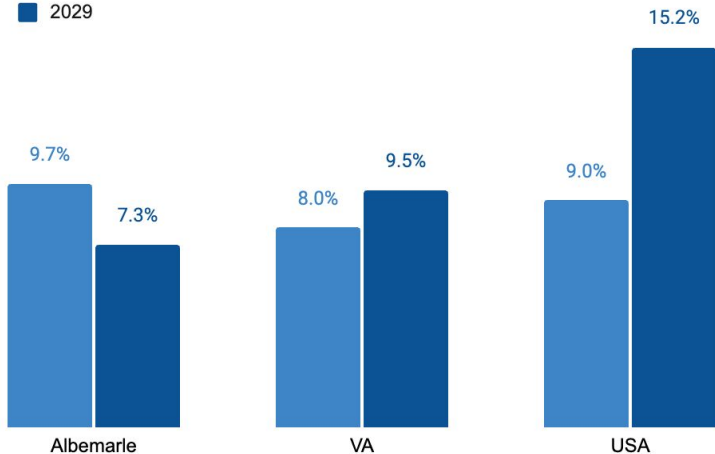
■ 2024 ■ 2029

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	9.7%	-2.2%	**7.3%**
VA	8.0%	1.4%	**9.5%**
USA	9.0%	5.6%	**15.2%**

Source: Lightcast

Residential remodelers, one of the largest industries in the cluster, also lost the most jobs over the past 5 years

5-Year Job Growth by LQ for Industries in Cluster (LQs >1)
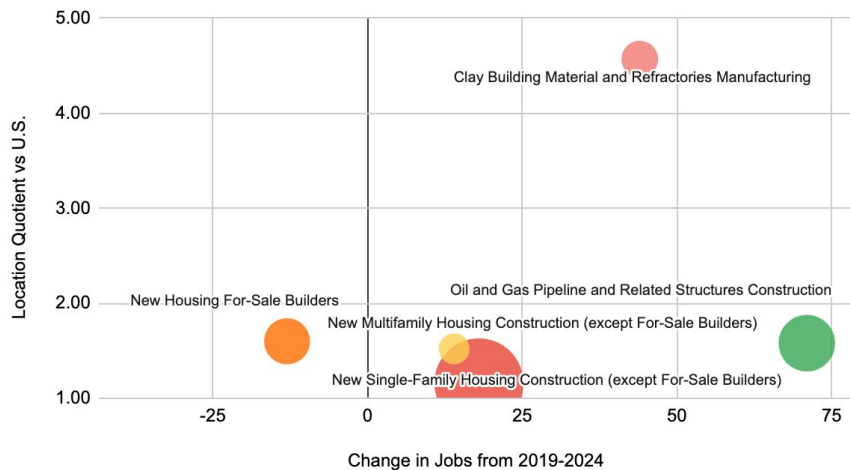
5-Year Job Growth by LQ for Industries in Cluster (LQs <1)
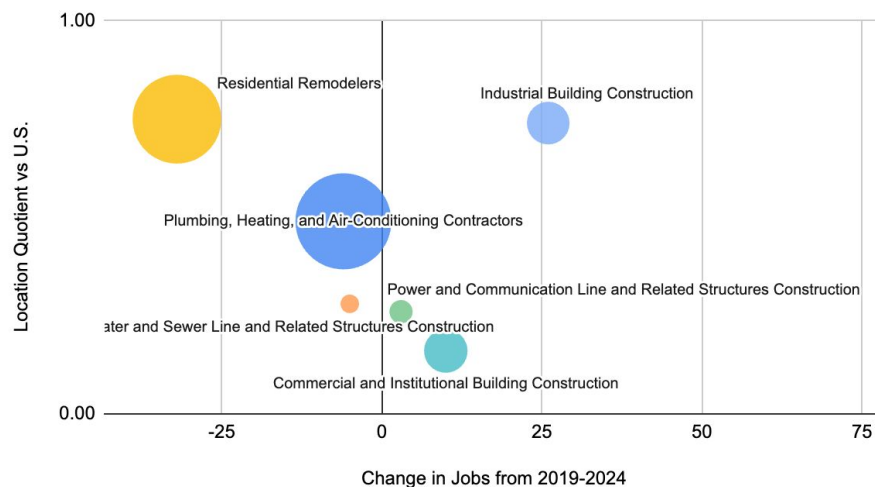
Note: Size of each bubble is based on the size of employment in 2024.

The cluster has a small, negative competitive effect
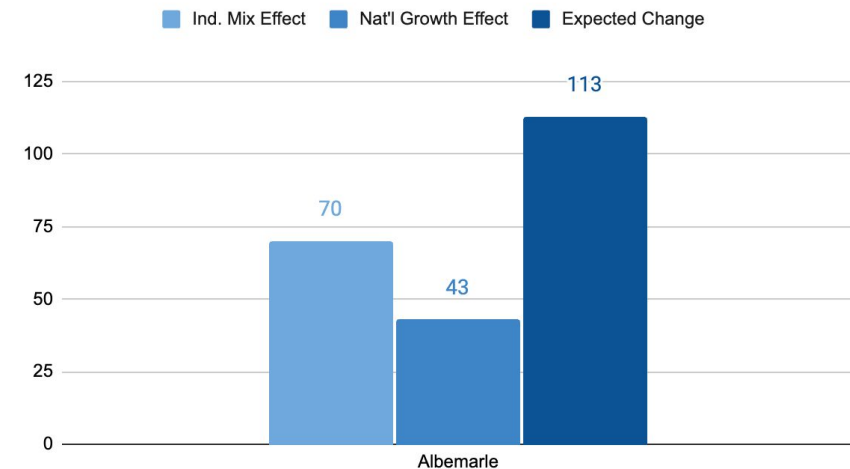
Composition of Expected Change in Jobs from 2019-2024

■ Ind. Mix Effect   ■ Nat'l Growth Effect   ■ Expected Change

Source: Lightcast

Expected vs Actual Change in Jobs from 2019-2024

■ Expected Change   ■ Actual Change   ■ Competitive Effect
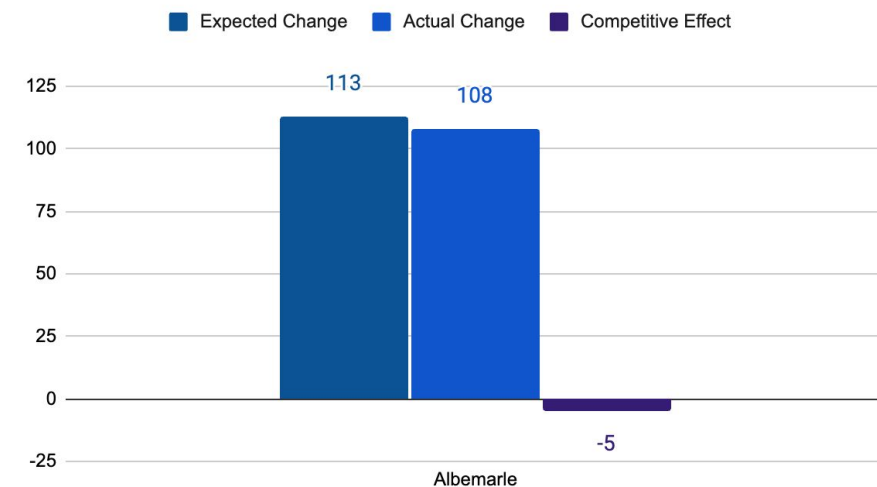
Source: Lightcast

The cluster's GRP doubled over the past decade, growing at about the same rate as the state and the nation

Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)
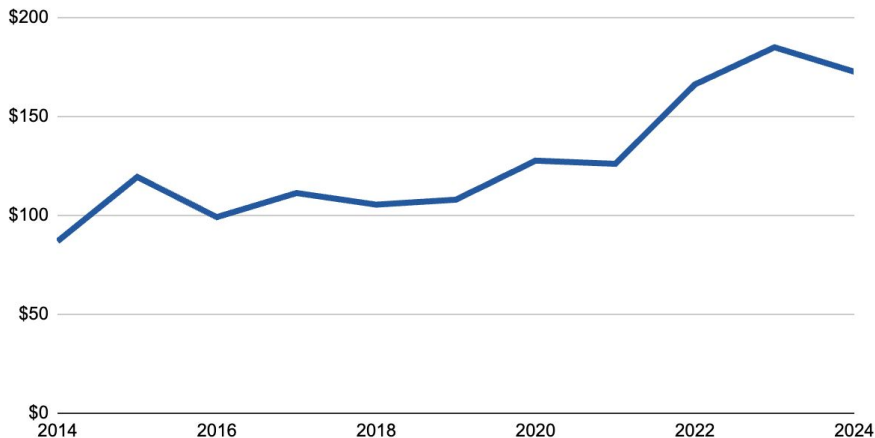
Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

Albemarle — VA — USA
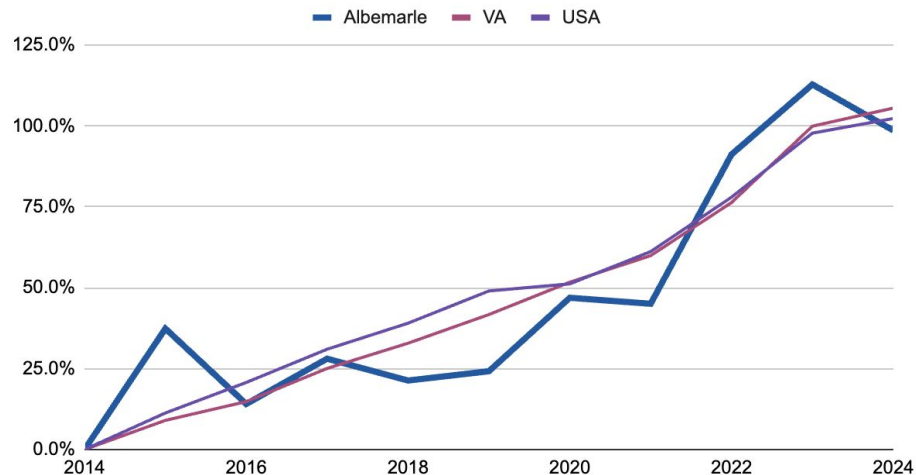
Source: Lightcast

The cluster's GRP per worker grew 46% over the past 5 years

GRP per Worker, by Region and Year
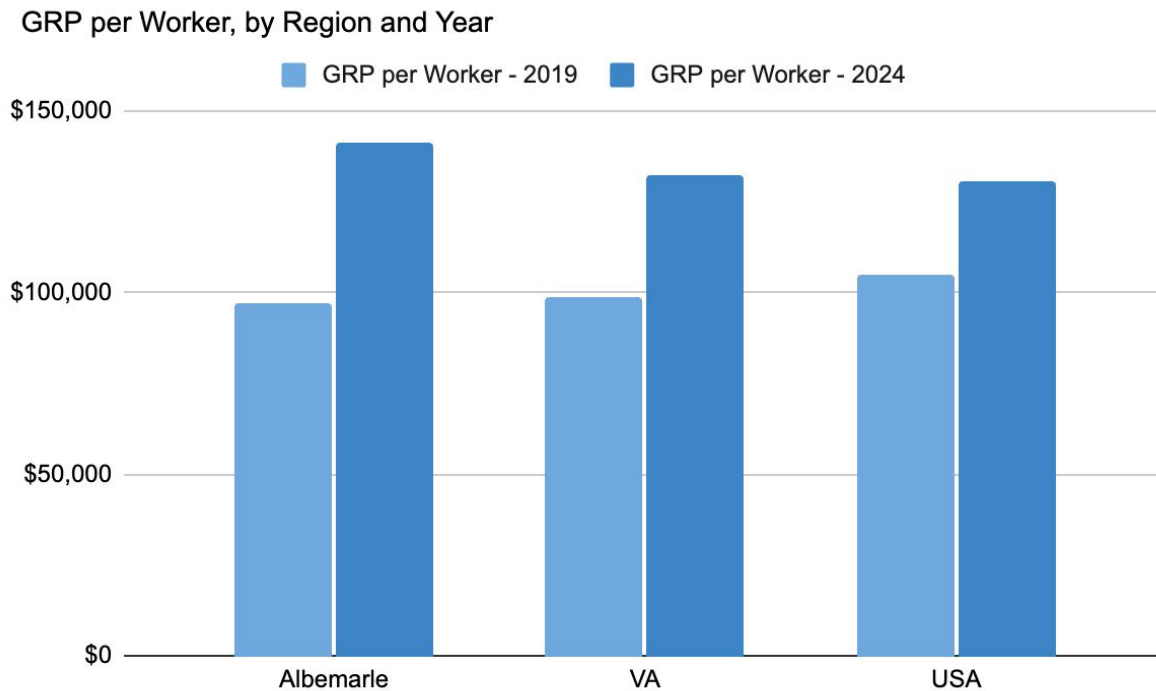
Source: Lightcast

The cluster now has a competitive advantage over the state and nation in productivity

Location Quotient for GRP per Worker Compared to Virginia, by Year
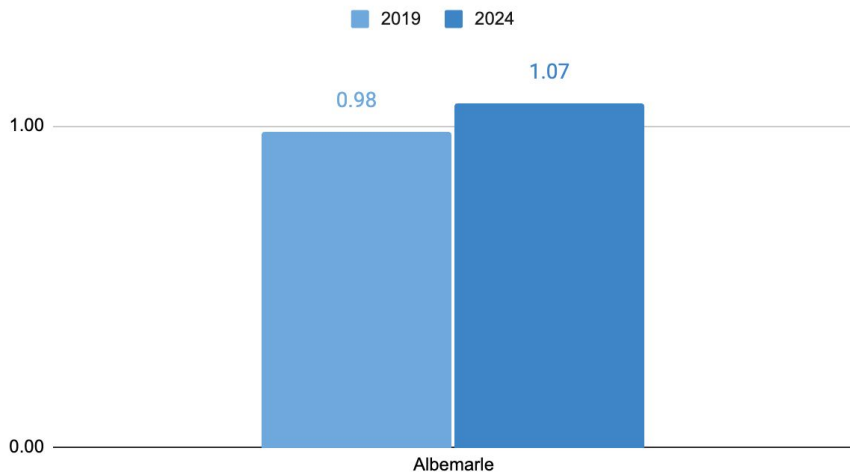
Location Quotient for GRP per Worker Compared to the U.S., by Year

Source: Lightcast

Source: Lightcast

resonance
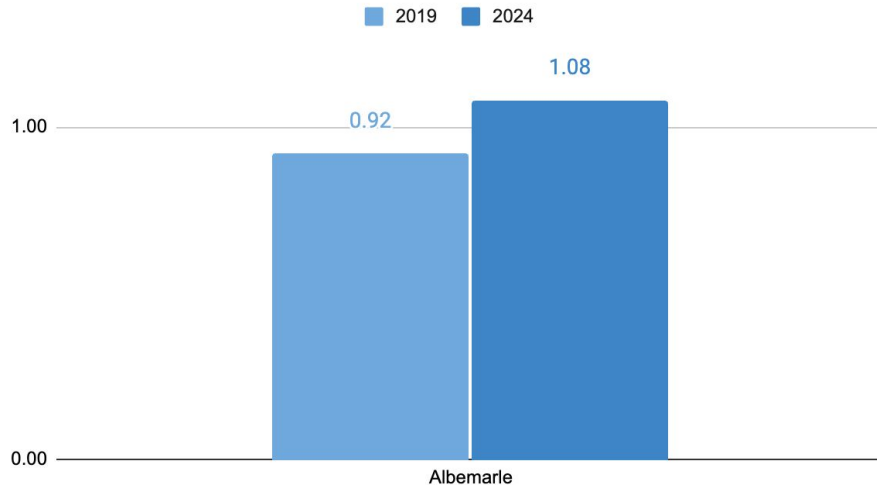
The cluster exports $3 out of every $10 in sales outside of the region - slightly more than the state

% of Exported Sales in 2024, by Region
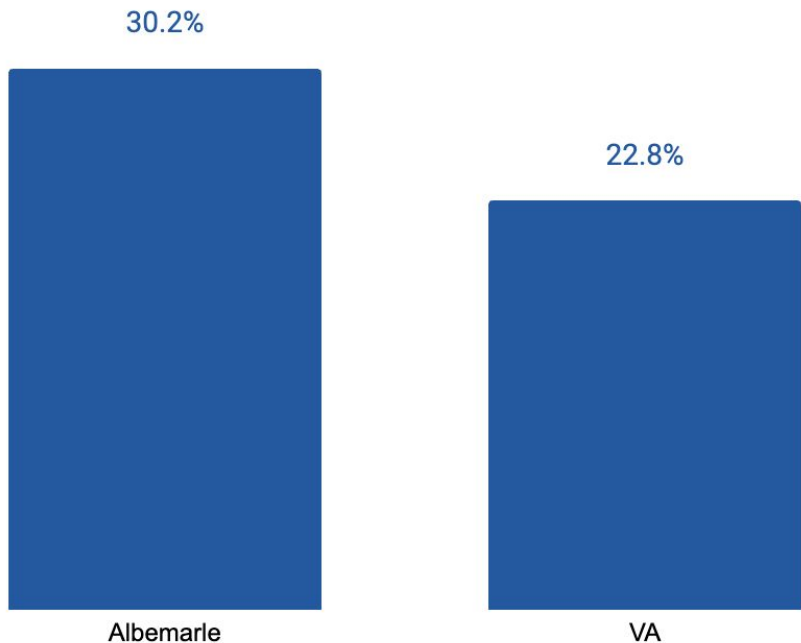
Source: Lightcast

Average industry earnings per job increased around $10k from 2022 to 2023 and is now only 3% lower than the Commonwealth and the nation

Average Annual Earnings per Job in 2024, by Region
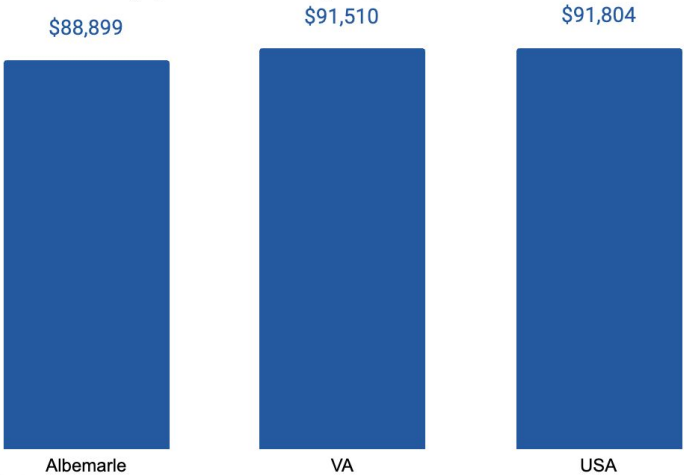
$88,899 — Albemarle
$91,510 — VA
$91,804 — USA

Source: Lightcast

Average Annual Earnings per Job, by Year and Region

Legend: 2019 2020 2021 2022 2023 2024

Y-axis: $0, $25,000, $50,000, $75,000, $100,000

Regions: Albemarle, VA, USA

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

resonance

Less than 2 out of every 10 workers in the cluster are female - a slightly smaller share of than the state and nation

Composition of Males and Females in Cluster in 2024, by Region

■ Males ■ Females

Albemarle	VA	USA
16.2%	16.8%	17.0%
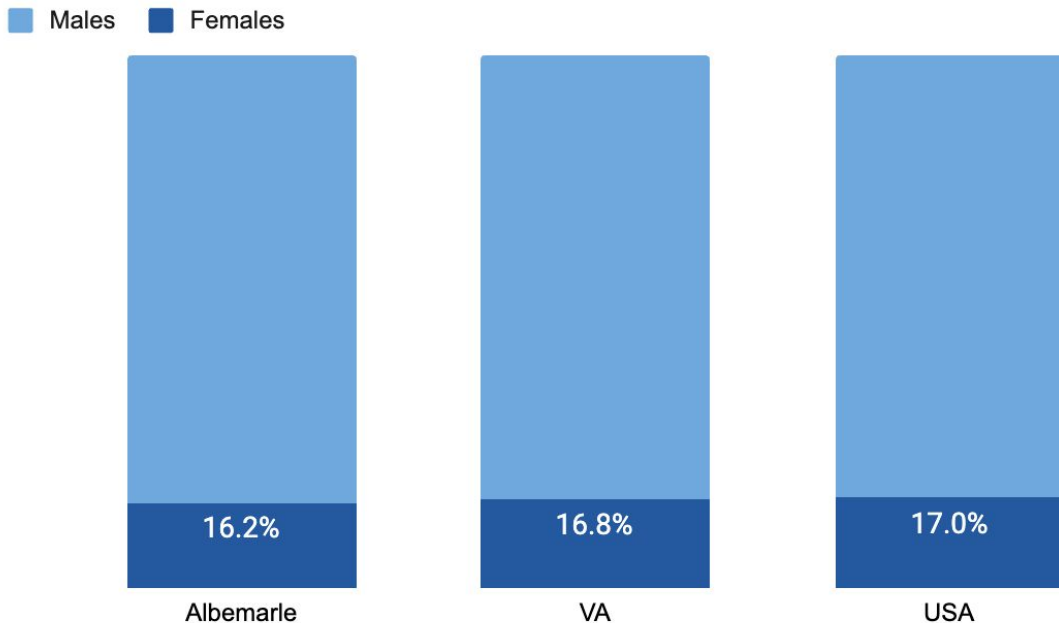
Source: Lightcast

Non-white workers account for 22% of the cluster's workforce - less than the share of non-white residents in the county overall (26%)

Race/Ethnicity Composition of Cluster in 2024

Other
1.4%

Hispanic or Latino
8.3%

Black or African Am…
11.0%

White
78.3%

Clean Technology and Renewable Energy
Equity
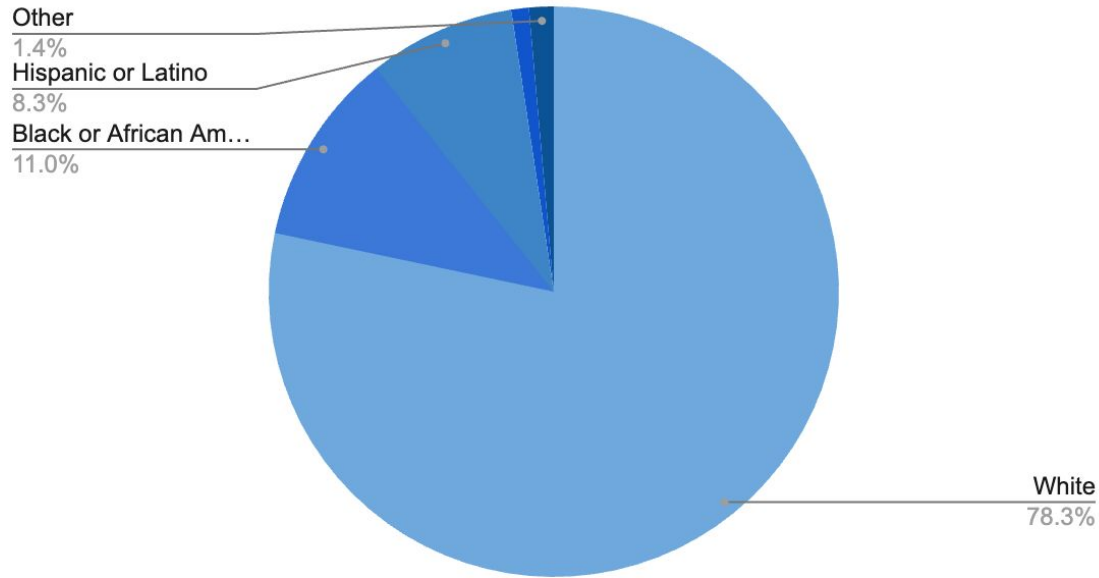
The cluster has a larger share of Black or African American workers than the state and nation

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce ■ Albemarle Population

Source: Lightcast

Note:the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.

resonance

With nearly 3 out of 10 workers over the age of 55, the cluster faces a high retirement risk

Age Composition of Cluster in 2024

Age 65+
8.2%

Age 19-21
3.4%

Age 22-24
4.6%

Age 25-34
17.5%

Age 55-64
21.3%

Age 45-54
20.9%

Age 35-44
23.2%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA   ■ LQ - Age 55+ compared to US

1.10

1.20

1.00

0.00

Albemarle

Source: Lightcast

resonance

About 3 out of every 10 workers in the cluster have a Bachelor's Degree or higher

Education Composition of Cluster in 2024

Doctorate
3.0%

Masters
4.2%

Bachelors
23.4%

Associates
1.2%

No College Degree
68.2%

The cluster has a competitive advantage when it comes to educational attainment

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - BA and above - VA   ■ LQ - BA and above - US

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - Masters and above - VA   ■ LQ - Masters and above - US

Source: Lightcast

resonance
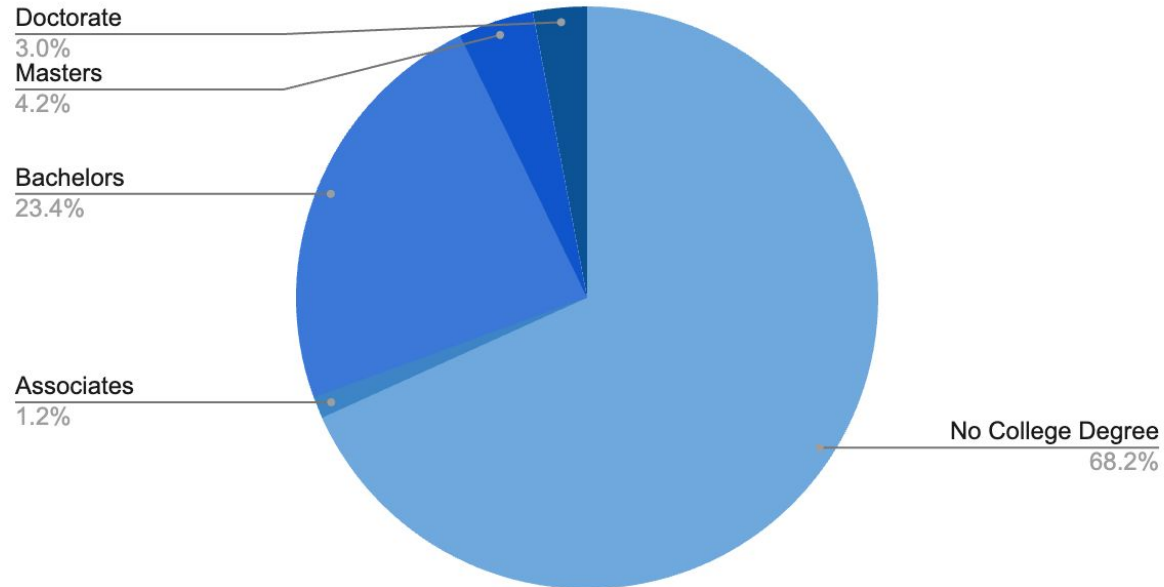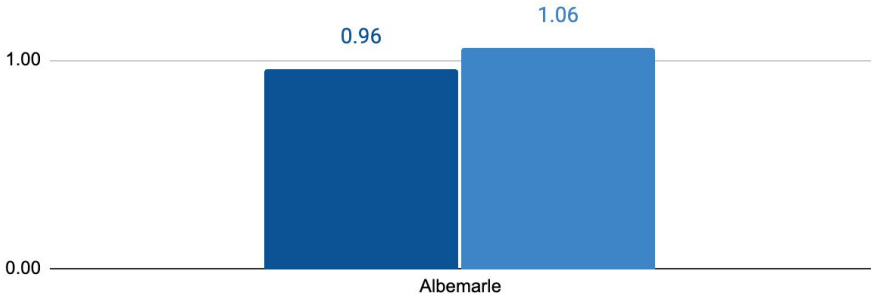
The region may not be fully satisfying the cluster's supply chain requirements, as nearly 60% of demand is imported from outside the region - over twice as high compared to the state (25%)

% of Demand Met In-Region
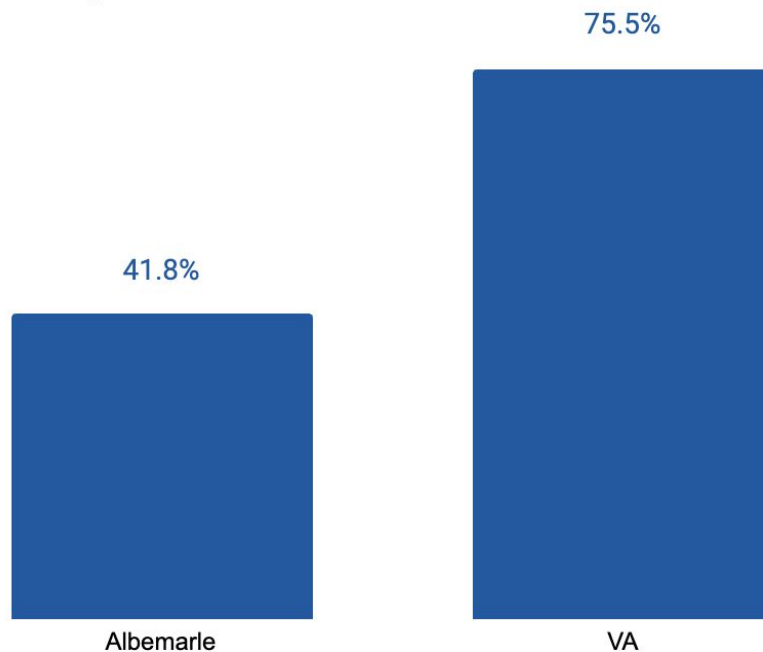
Source: Lightcast

Occupations in the cluster face a high risk of automation

% of Jobs at Risk of Automation

75.0%

Albemarle

Source: Lightcast

Median earnings for occupations in the cluster are about on par with the Commonwealth and the nation
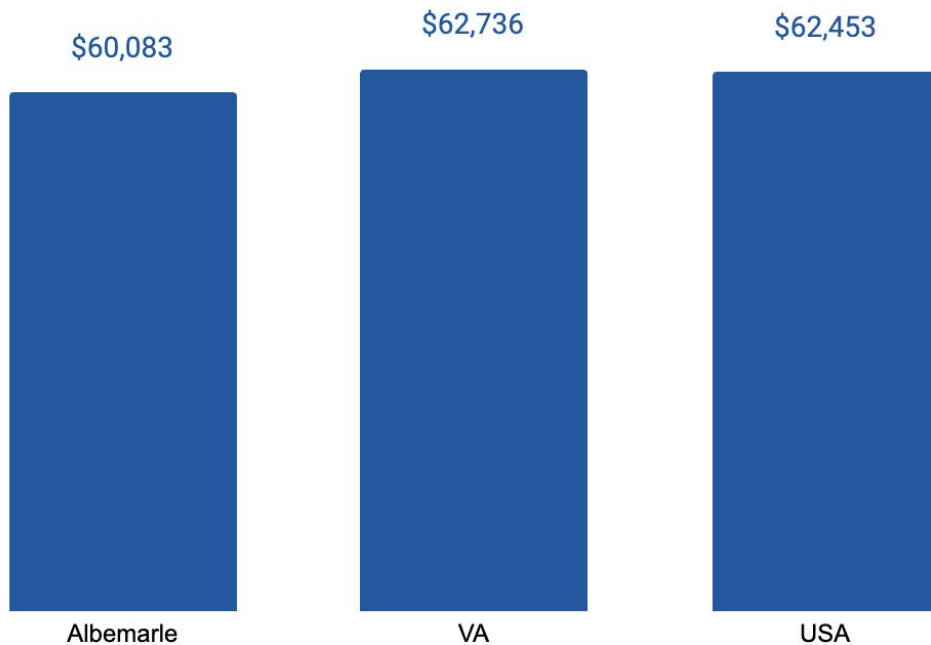
Median Annual Earnings in 2023, by Region

Source: Lightcast

Median earnings for occupations in the cluster grew 18% over the past 5 years, the same rate as the nation overall

Median Annual Earnings, by Year and Region

Legend: 2018, 2019, 2020, 2022, 2023

Source: Lightcast

Regions: Albemarle, VA, USA

04
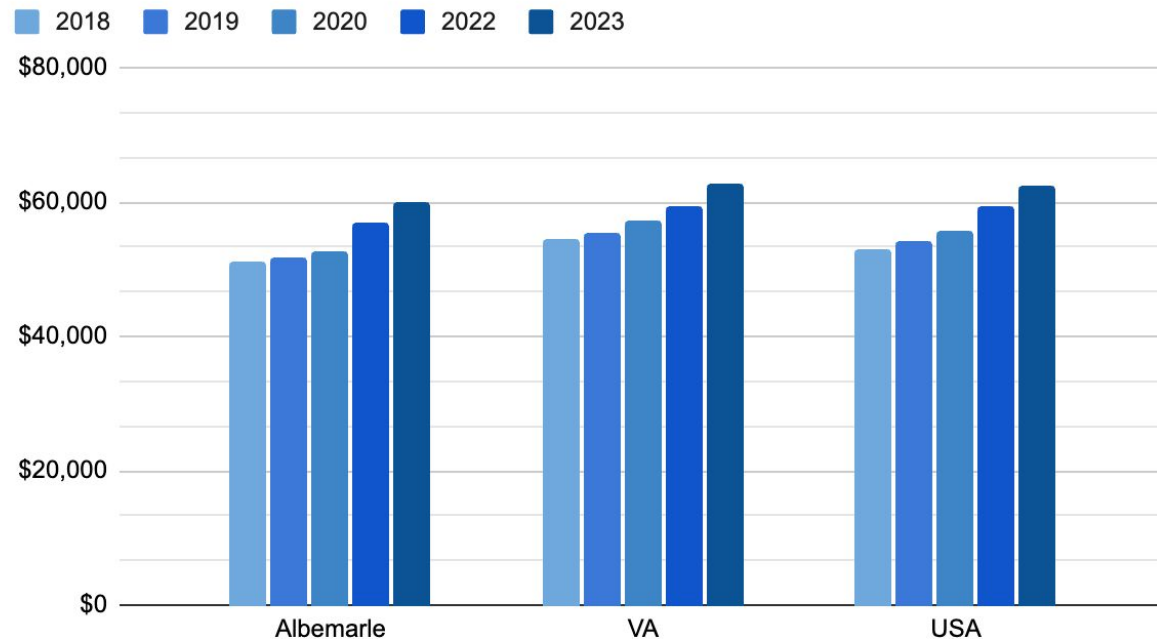
Intelligence and National Security

Overall LQ: 1.40
Total Employment: 939
Average Industry Earnings per Job: $127,052

Cluster Assets

-   Strategic location near D.C.

-   Rivianna Station

-   Able to satisfy 76% supply chain requirement in-region, highest among clusters

-   Most educated workforce (61% BA or above)

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	GRP (Millions)
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	438	-204	-31.8%	46.6%	8.25	$123,463	$99.3
541512	Computer Systems Design Services	415	10	2.5%	44.2%	0.80	$128,835	$73.2
541519	Other Computer Related Services	87	-4	-4.4%	9.2%	1.38	$136,642	$19.0
336412	Aircraft Engine and Engine Parts Manufacturing	0	0	N/A	0.0%	0.00	$0	$0.0
ABCV04	**Intelligence & National Security**	**939**	**-198**	**-17.5%**	**100%**	**1.40**	**$127,052**	**$191.5**

The share of employment in the cluster is a competitive advantage for Albemarle compared to the nation, although that advantage has decreased in recent years

LQ for % of Jobs in Cluster Compared to Virginia, by Year
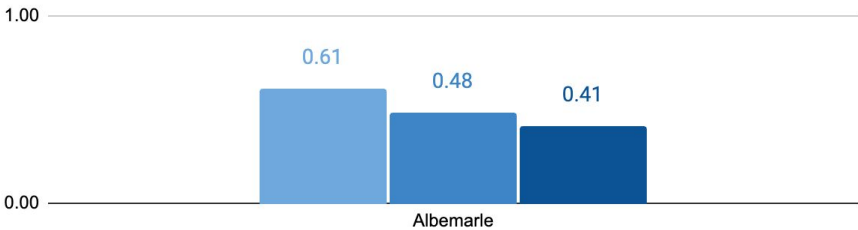
■ 2019 ■ 2024 ■ 2029

Source: Lightcast

LQ for % of Jobs in Cluster Compared to US, by Year

■ 2019 ■ 2024 ■ 2029

Source: Lightcast

resonance
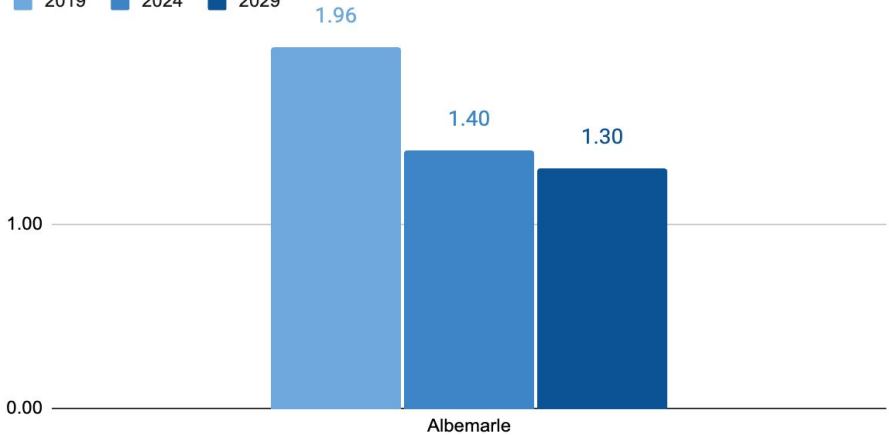
The supply of jobs decreased 17% over the past 5 years and is projected to decrease 1% in the next 5 years

Total Employment in Cluster, by Year

Source: Lightcast

resonance
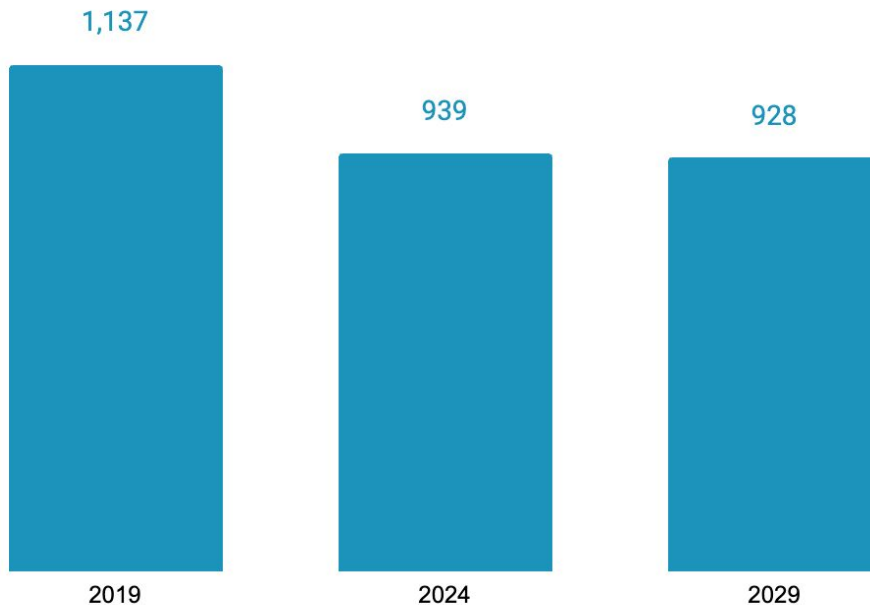
The cluster in the region decreased exponentially more than the Commonwealth

Cumulative Growth in Employment since 2019, Scaled by Region Size
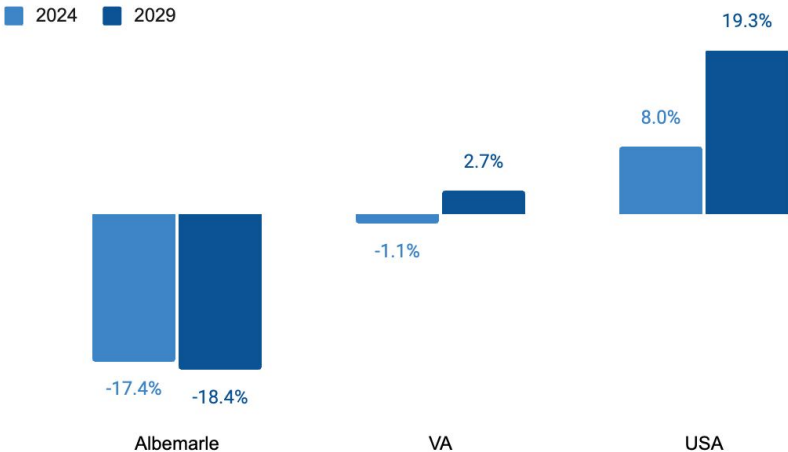
■ 2024 ■ 2029

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	-17.4%	-1.2%	**-18.4%**
VA	-1.1%	3.9%	**2.7%**
USA	8.0%	10.5%	**19.3%**

Source: Lightcast

Due to the decrease in jobs in Search, Detection, and other System and Instrumentat Manufacturing, Computer Systems Design Services is now the largest industry in the cluster - despite not having a competitive advantage relative to the nation

5-Year Job Growth by LQ for Industries in Cluster
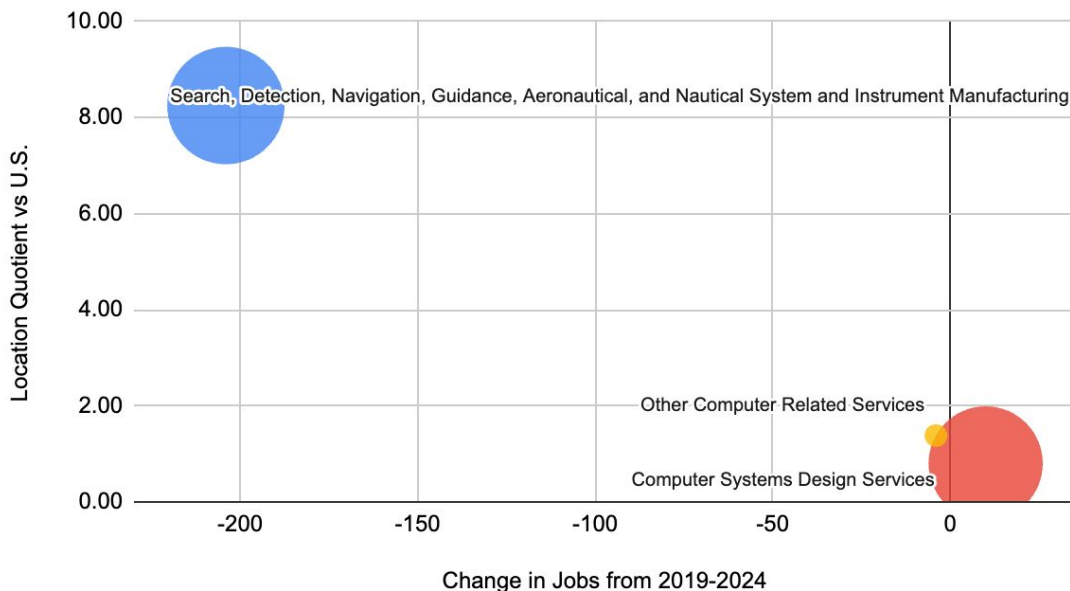
Note: Size of each bubble is based on the size of employment in 2024.

The cluster was expected to gain 5 jobs based on national industry and economic trends, but instead lost nearly 200

Composition of Expected Change in Jobs from 2019-2024
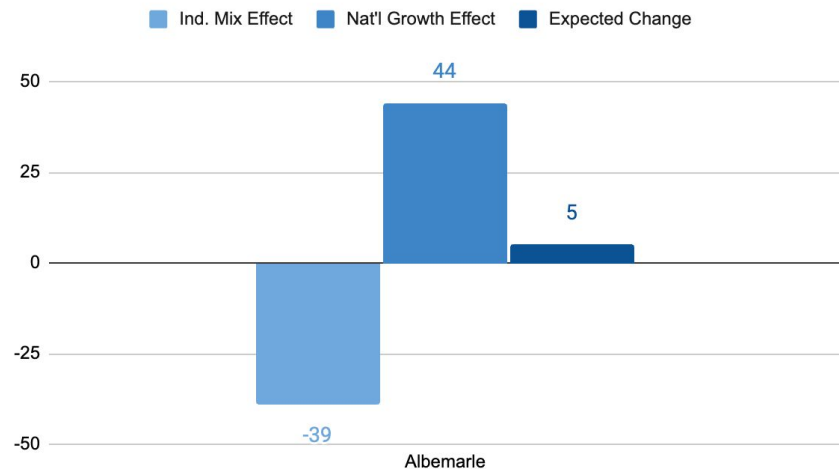
- Ind. Mix Effect
- Nat'l Growth Effect
- Expected Change

44

5

0

-39

Albemarle

Source: Lightcast

Expected vs Actual Change in Jobs from 2019-2024

- Expected Change
- Actual Change
- Competitive Effect

5

-198

-203

Albemarle
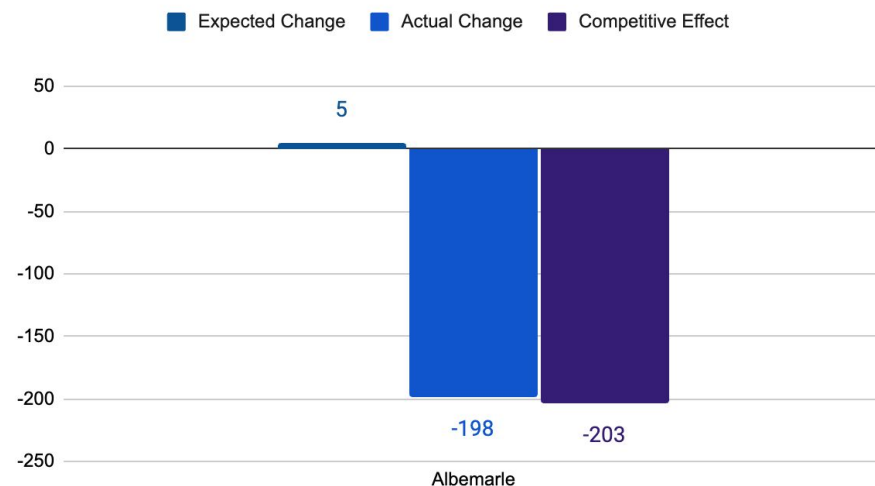
Source: Lightcast

The cluster's GRP has remained stagnant over the past decade, while the nation and Commonwealth grew by nearly 60%

Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)
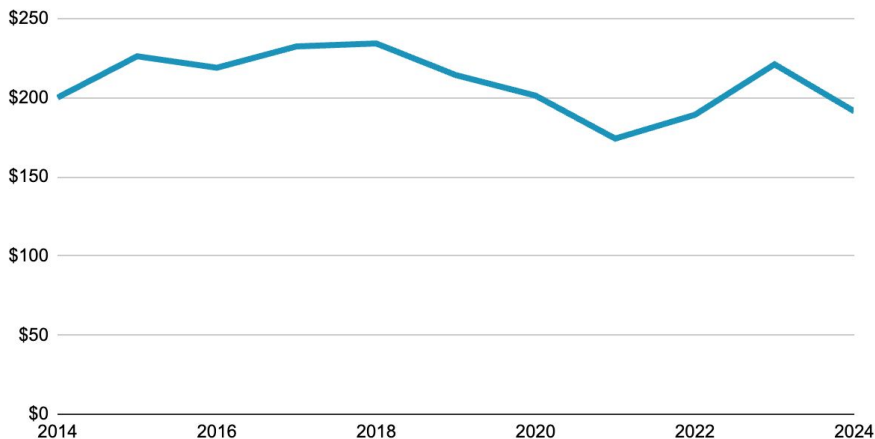
Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

— Albemarle — VA — USA
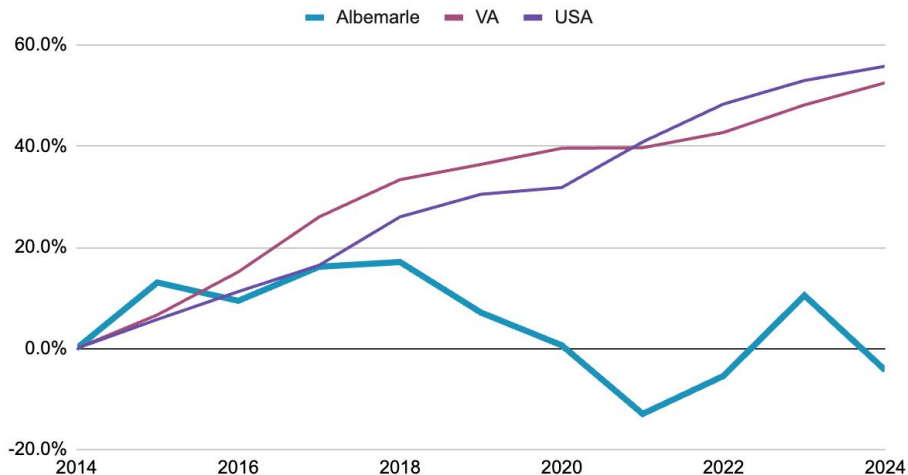
Source: Lightcast

The cluster's GRP per worker grew 8% over the past 5 years

GRP per Worker, by Region and Year

■ GRP per Worker - 2019   ■ GRP per Worker - 2024
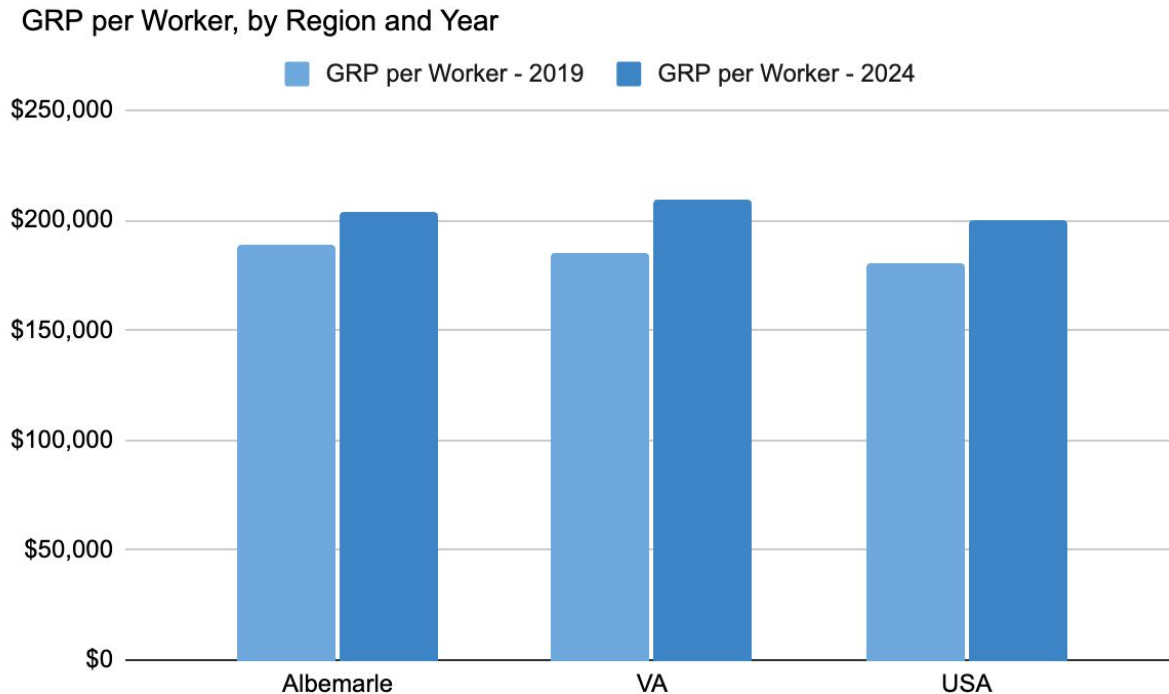
Source: Lightcast

The cluster has remained competitive with the state and nation in its economic productivity

Location Quotient for GRP per Worker Compared to Virginia, by Year

■ 2019 ■ 2024

1.02
0.97

1.00

0.00

Albemarle

Source: Lightcast

Location Quotient for GRP per Worker Compared to the U.S., by Year

■ 2019 ■ 2024

1.04
1.02

1.00

0.00

Albemarle
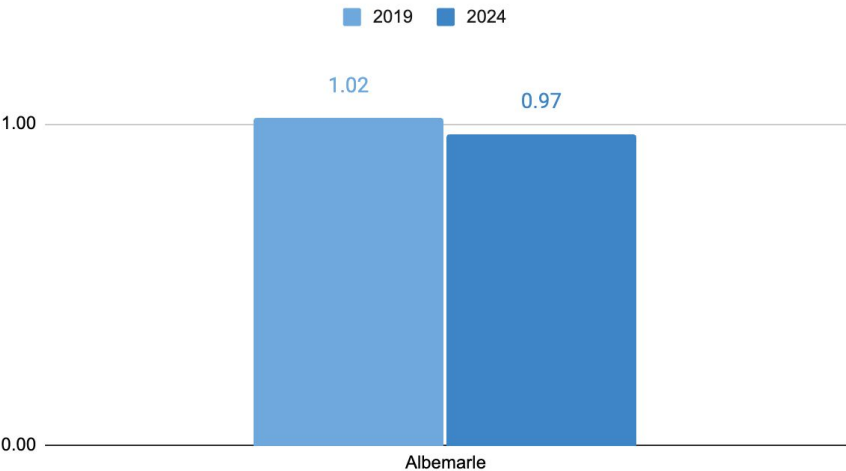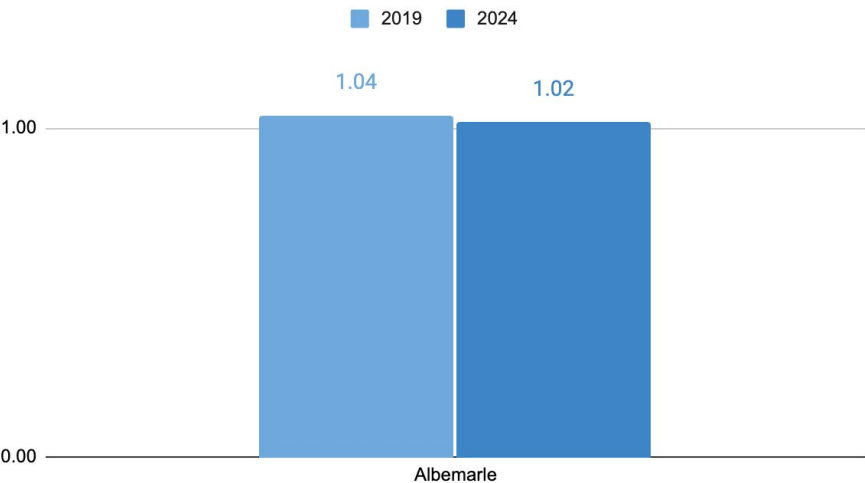
Source: Lightcast

The cluster exports nearly $6 out of every $10 in sales outside of the region - less than the state

% of Exported Sales in 2024, by Region

57.3% — Albemarle

71.5% — VA
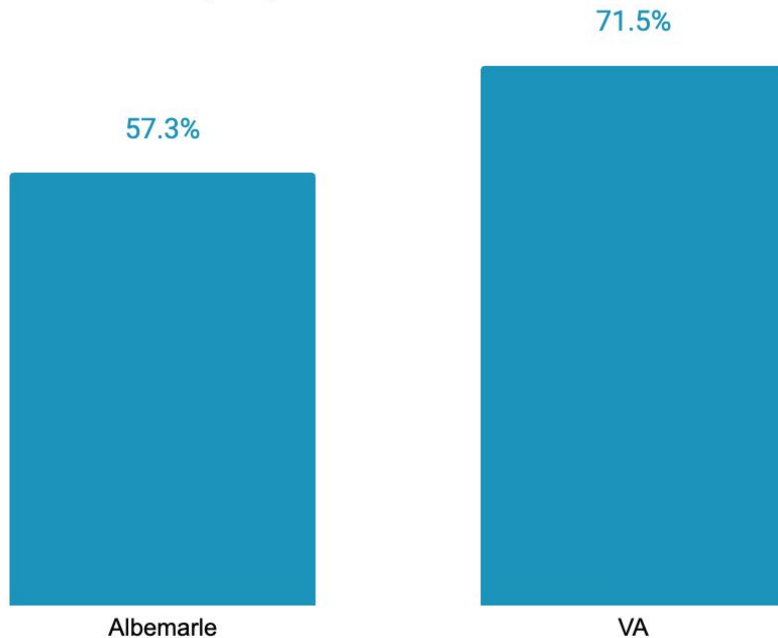
Source: Lightcast

Average industry earnings per job is 40% lower than the Commonwealth and 24% lower than the national average
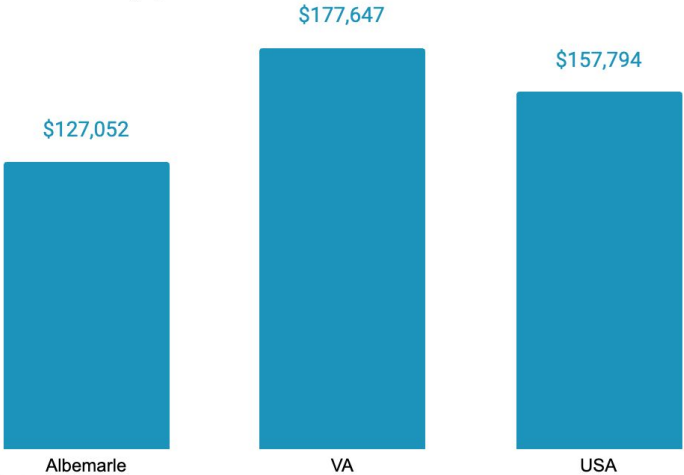
Average Annual Earnings per Job in 2024, by Region

Source: Lightcast

Average Annual Earnings per Job, by Year and Region

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

resonance

Around 3 out of every 10 workers in the cluster are female - a slightly smaller share than the state and nation

Composition of Males and Females in Cluster in 2024, by Region

■ Males ■ Females

Albemarle	VA	USA
30.5%	34.3%	32.8%

Source: Lightcast

resonance
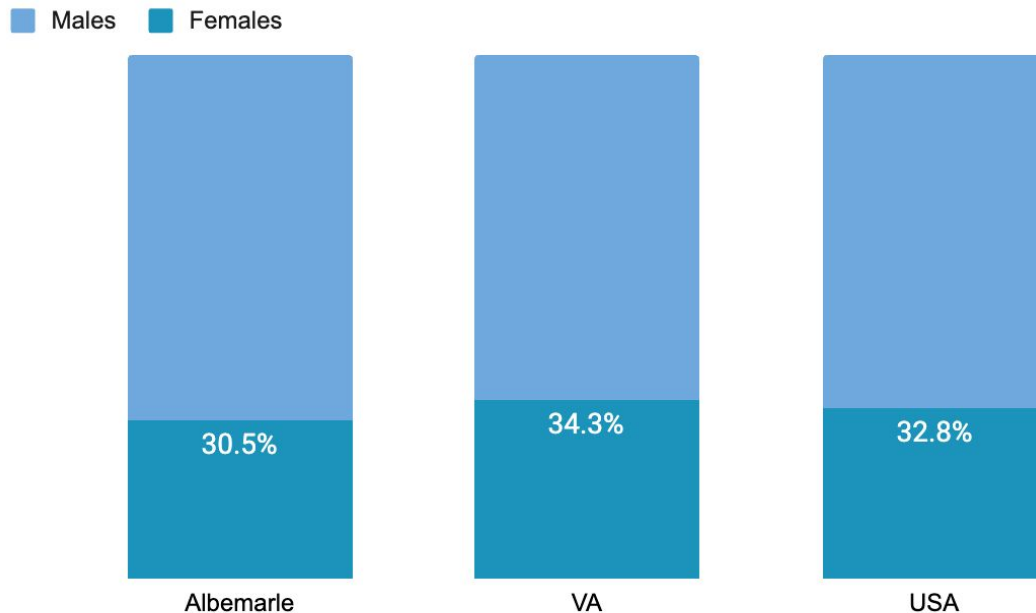
Non-white workers account for 28% of the cluster's workforce - higher than the share of non-white residents in the county overall (26%)

Race/Ethnicity Composition of Cluster in 2024

Other
2.2%

Asian
12.1%

Hispanic or Latino
4.2%

Black or African Am…
9.3%

White
72.2%
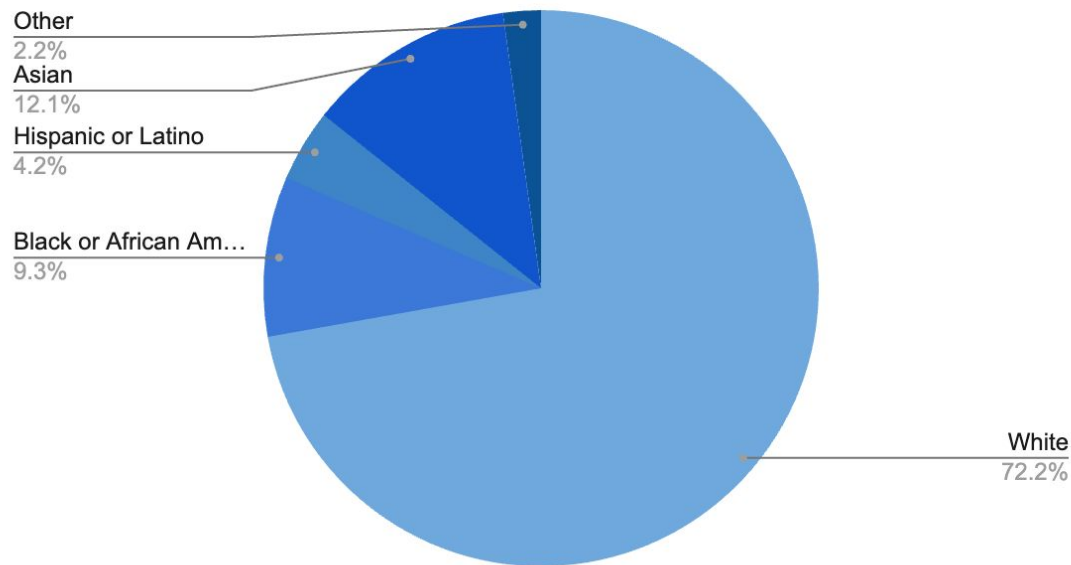
The regional cluster has a larger share of Black or African American workers compared to the national cluster

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Note:the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.

resonance

With nearly 26% of its workers over the age of 55, the cluster faces a high retirement risk

Age Composition of Cluster in 2024

Age 65+
7.0%

Age 22-24
3.6%

Age 55-64
19.0%

Age 25-34
22.6%

Age 45-54
22.7%

Age 35-44
24.0%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA ■ LQ - Age 55+ compared to US

1.21

1.26

1.00

0.00

Albemarle
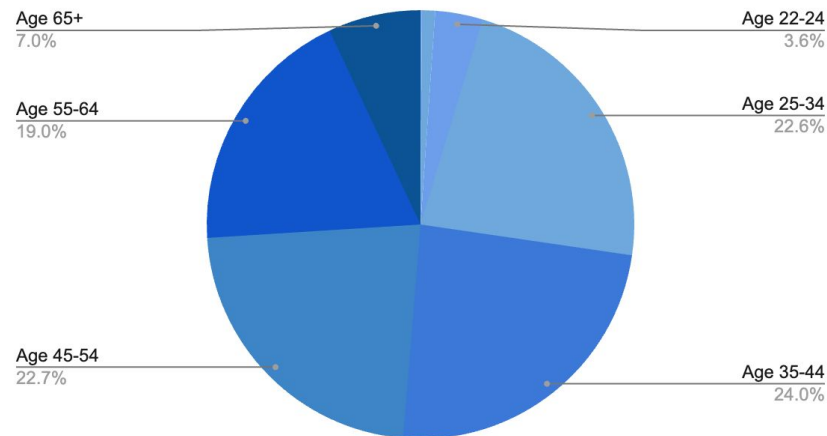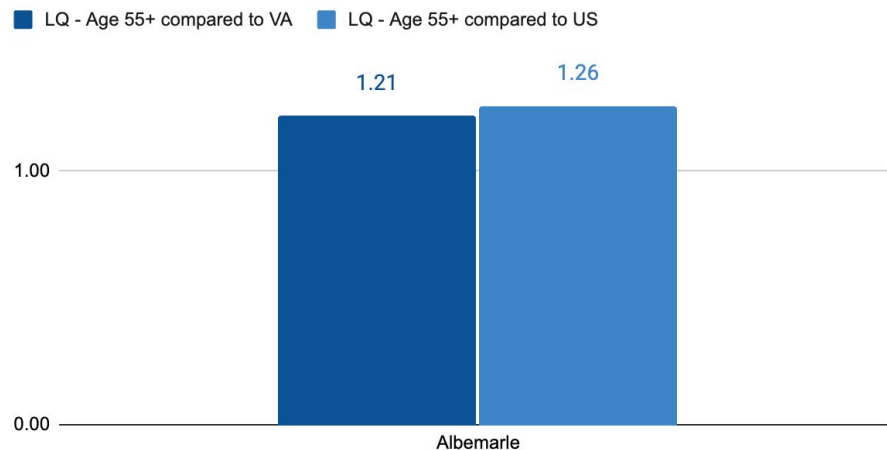
Source: Lightcast

One of the most highly educated clusters, over 6 out of every 10 workers have a Bachelor's Degree or higher

Education Composition of Cluster in 2024

Doctorate
3.4%

Masters
25.0%

No College Degree
37.1%

Bachelors
32.8%

Associates
1.7%

The cluster has a competitive advantage when it comes to educational attainment

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - BA and above - VA   ■ LQ - BA and above - US

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - Masters and above - VA   ■ LQ - Masters and above - US

Source: Lightcast

resonance
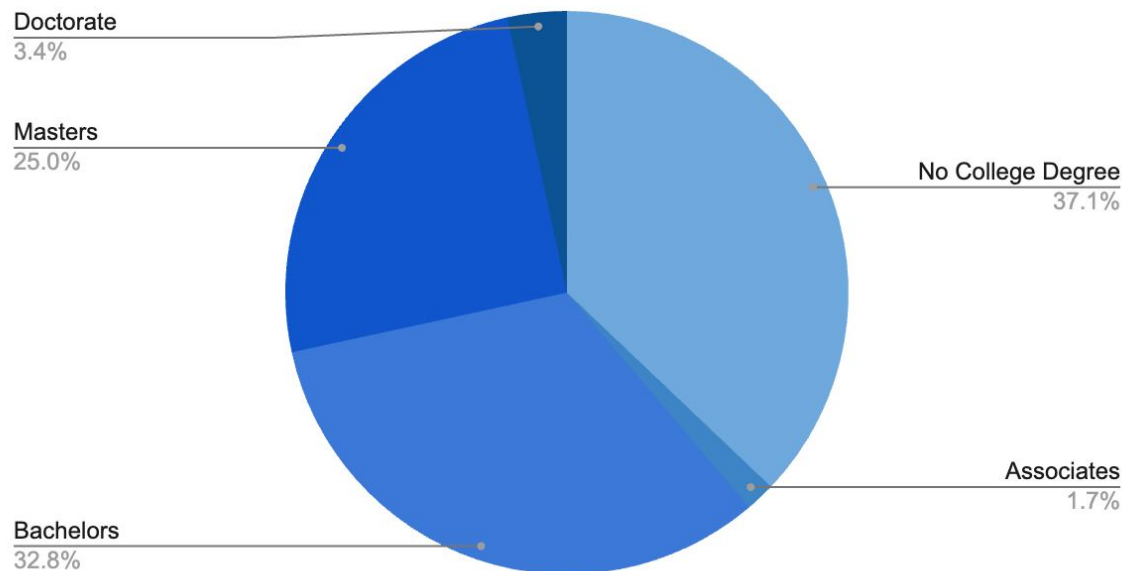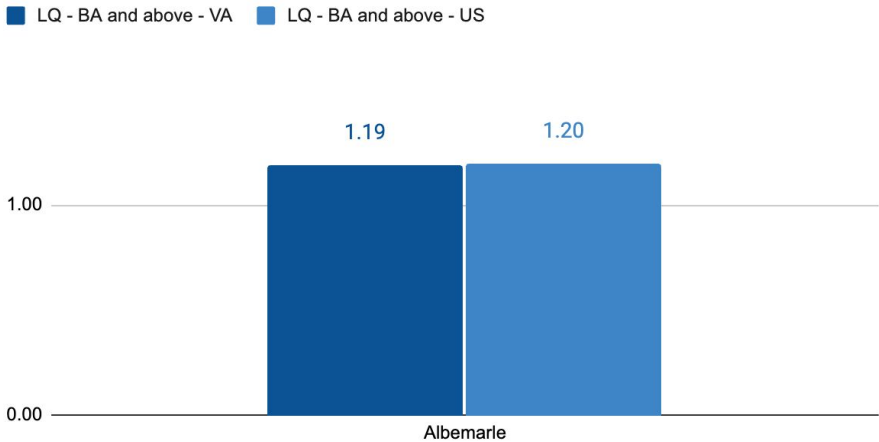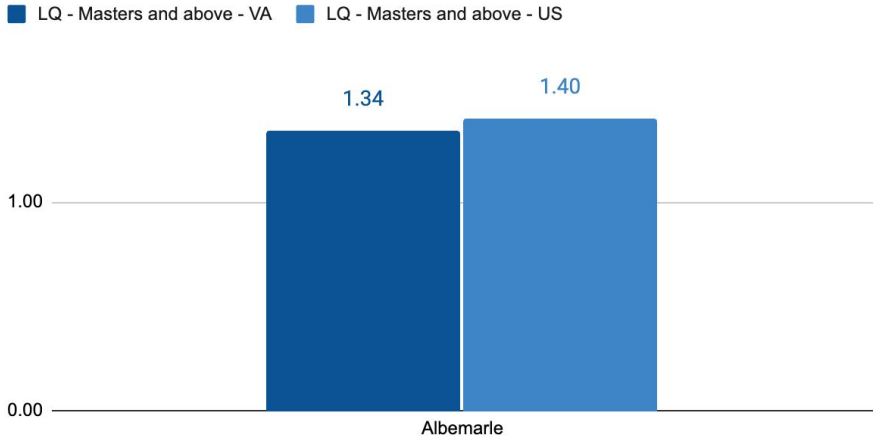
With only around 25% of demand being imported, the cluster is able to satisfy most of its supply chain requirements in the region

% of Demand Met In-Region
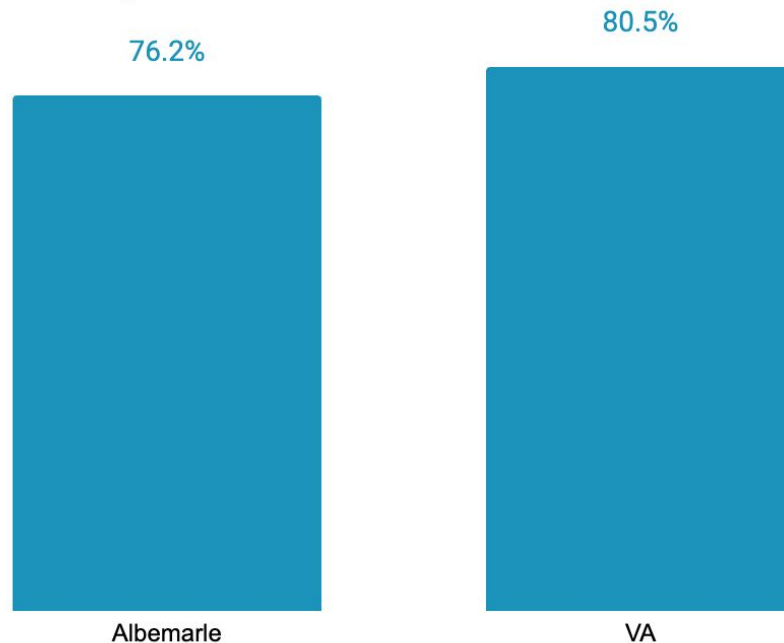
Source: Lightcast

Occupations in the cluster face a relatively low risk of automation

% of Jobs at Risk of Automation

17.5%

Albemarle

Source: Lightcast

Median earnings for occupations in the cluster are 27% lower than the Commonwealth and 13% lower than the nation

Median Annual Earnings in 2023, by Region
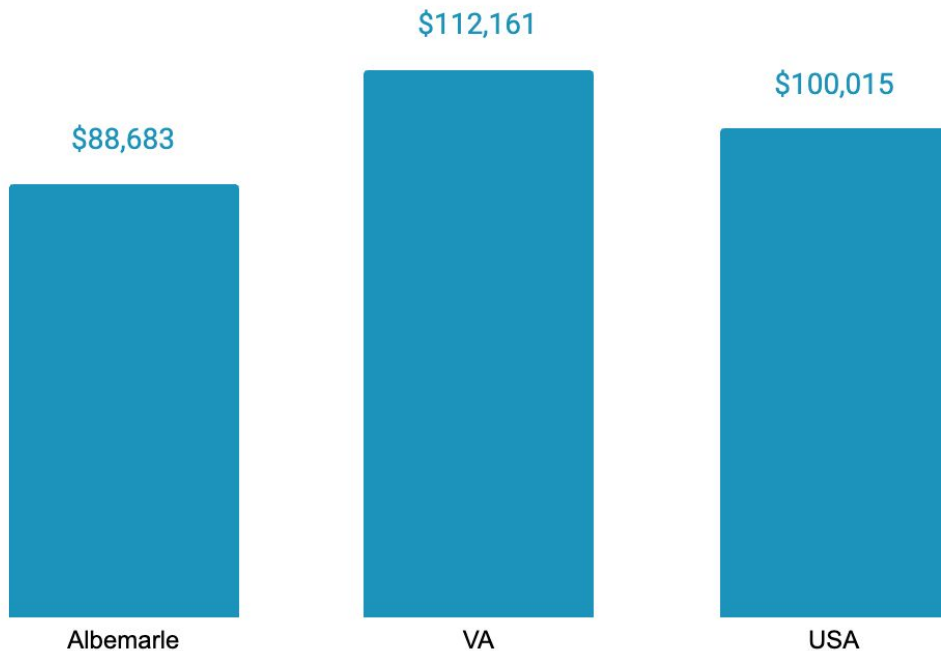
Source: Lightcast

Median earnings for occupations in the cluster grew 16% over the past 5 years, slightly slower than the Commonwealth (18%) and nation (19%)

Median Annual Earnings, by Year and Region
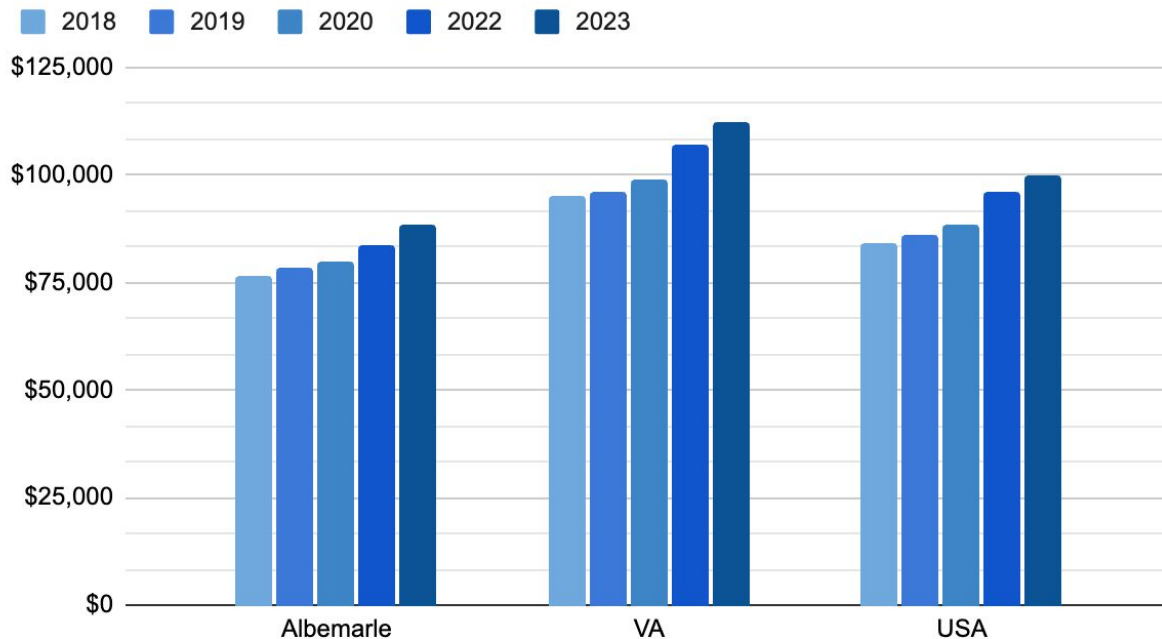
Source: Lightcast

05

Information Technology

Overall LQ: 0.62
Total Employment: 335
Average Industry Earnings per Job: $239,166

Cluster Assets

- Most productive cluster ($723,000 GRP per worker)

- Lowest retirement risk among clusters (22% age 55+)

- Most competitive wages ($90,000)

Information Technology

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	2024 GRP
513210	Software Publishers	181	-64	-26.1%	53.9%	0.66	$311,301	$193.5
518210	Data Processing, Hosting, and Related Services	94	38	67.9%	28.2%	0.44	$147,458	$34.6
811210	Electronic and Precision Equipment Repair and Maintenance	60	-29	-32.6%	17.9%	1.15	$166,139	$14.0
ABCV05	**Information Technology**	**335**	**-55**	**-14.2%**	**100%**	**0.62**	**$239,166**	**$242.1**

The county no longer has a competitive advantage in the cluster relative to the state and nation

LQ for % of Jobs in Cluster Compared to Virginia, by Year
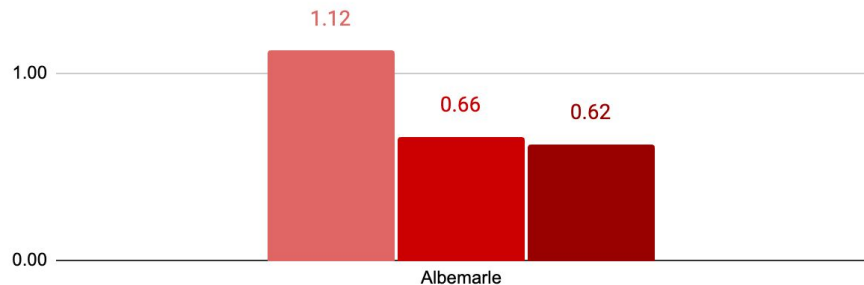
■ 2019   ■ 2024   ■ 2029

Source: Lightcast

LQ for % of Jobs in Cluster Compared to US, by Year

■ 2019   ■ 2024   ■ 2029
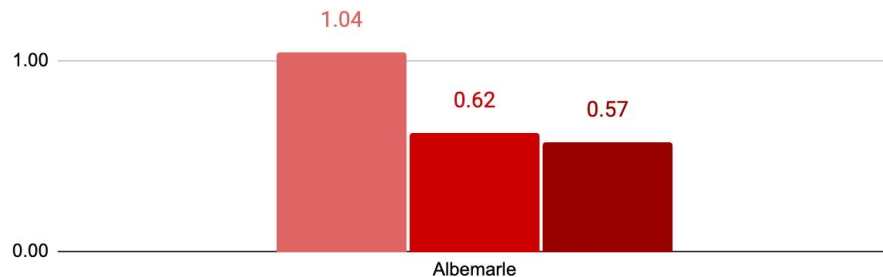
Source: Lightcast

The supply of jobs decreased 14% over the past 5 years and is projected to increase back to 2019 levels by 2029
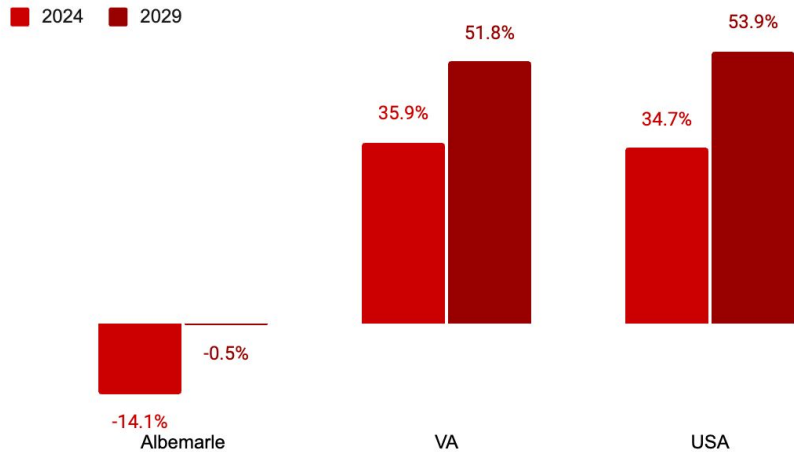
Total Employment in Cluster, by Year
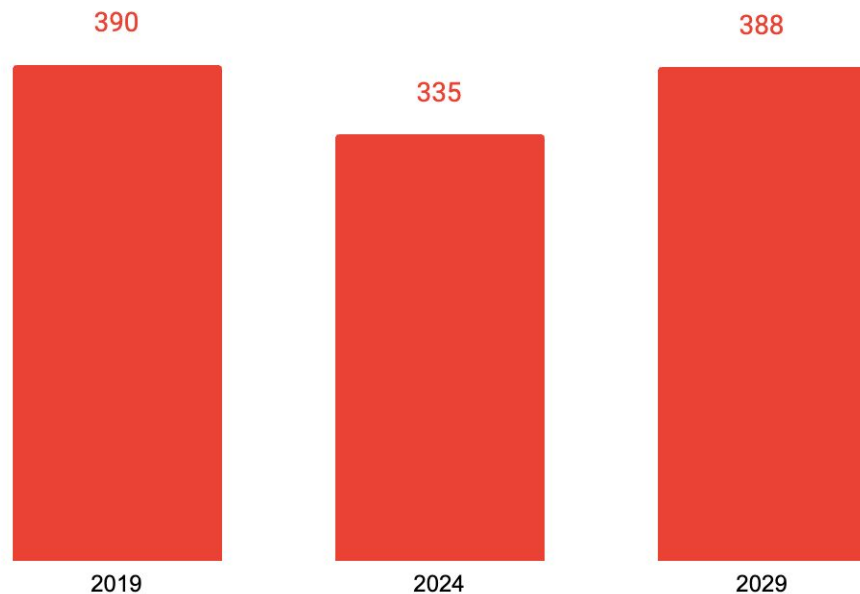
Source: Lightcast

The cluster in the region decreased while the Commonwealth and nation grew by 35% over the past 5 years

Cumulative Growth in Employment since 2019, Scaled by Region Size

■ 2024   ■ 2029

Source: Lightcast

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	-14.1%	15.8%	-0.5%
VA	35.9%	11.7%	51.8%
USA	34.7%	14.3%	53.9%

The loss in jobs was driven by less employment in Software Publishers, while Data Processing has been gaining jobs over the past few years

5-Year Job Growth by LQ for Industries in Cluster
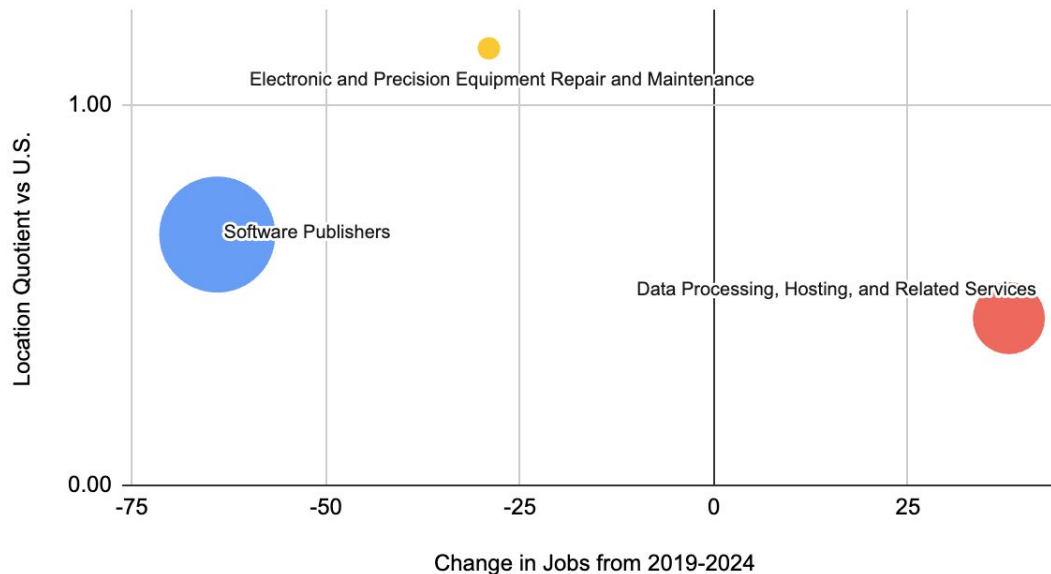
Electronic and Precision Equipment Repair and Maintenance

Software Publishers

Data Processing, Hosting, and Related Services

Location Quotient vs U.S.

1.00

0.00

-75   -50   -25   0   25

Change in Jobs from 2019-2024

Note: Size of each bubble is based on the size of employment in 2024.

resonance

The cluster was expected to gain nearly 120 jobs largely based on national industry trends, but instead lost 55 jobs - meaning the region had a negative competitive effect

Composition of Expected Change in Jobs from 2019-2024
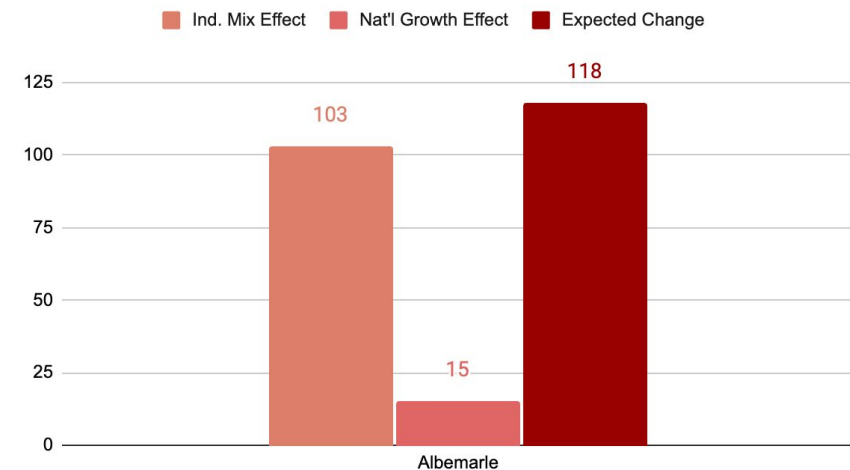
Source: Lightcast

Expected vs Actual Change in Jobs from 2019-2024
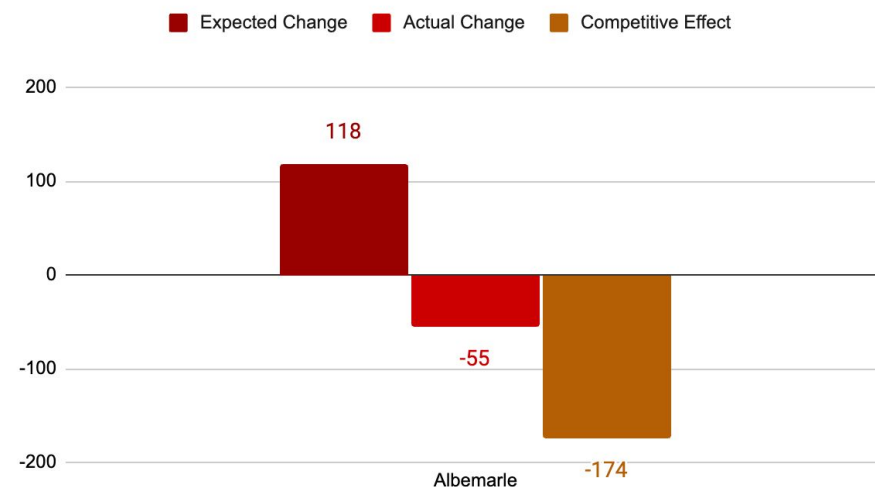
Source: Lightcast

The cluster's GRP has tripled since 2020 alone and has outpaced the state and nation over the past decade
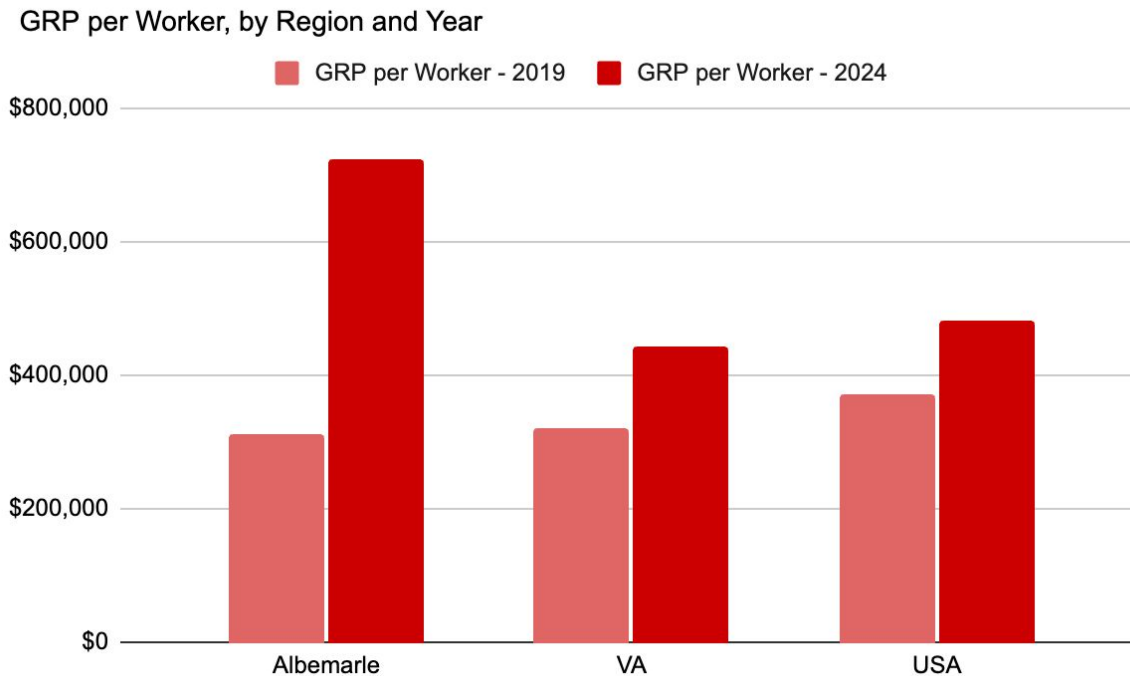
Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)
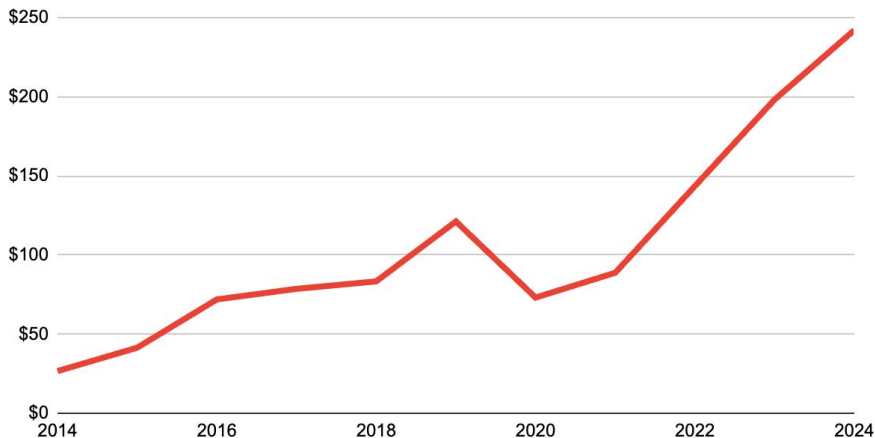
Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

Albemarle — VA — USA
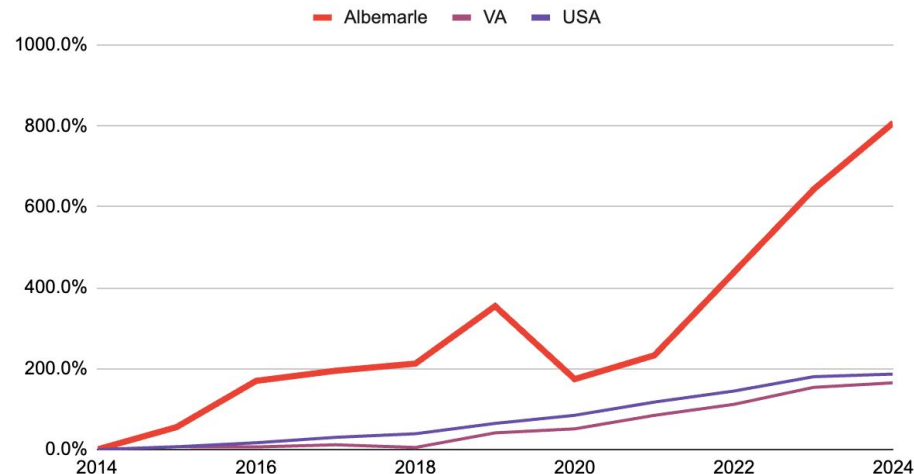
Source: Lightcast

The decrease in employment and increase in GRP cause the cluster's GRP per worker to more than double over the past 5 years
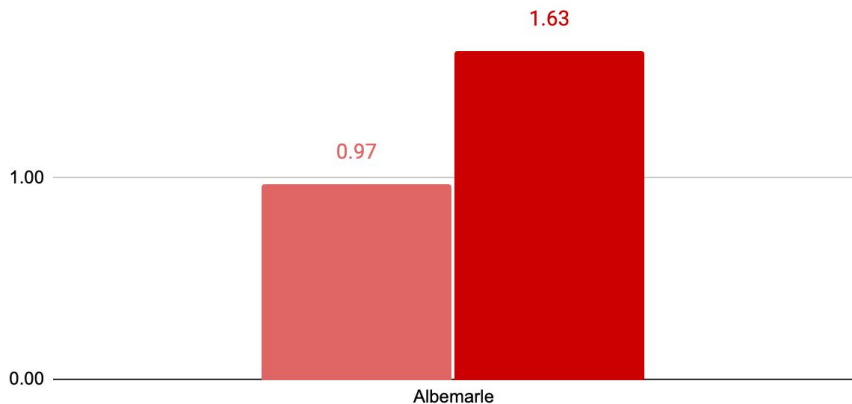

GRP per Worker, by Region and Year

Legend: GRP per Worker - 2019, GRP per Worker - 2024

Source: Lightcast

The cluster now has a competitive advantage over the state and nation in its economic productivity

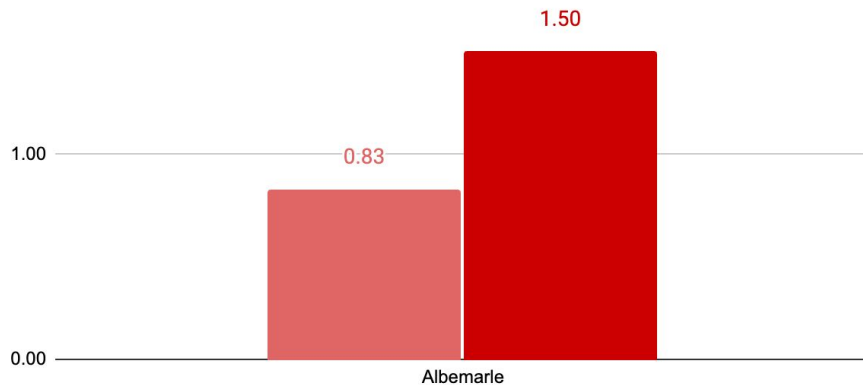Location Quotient for GRP per Worker Compared to Virginia, by Year

■ 2019   ■ 2024

1.63

0.97

1.00

0.00

Albemarle

Source: Lightcast

Location Quotient for GRP per Worker Compared to the U.S., by Year

■ 2019   ■ 2024

1.50

0.83

1.00

0.00

Albemarle

Source: Lightcast

The cluster exports over $3 out of every $10 in sales outside of the region - similar to the state

% of Exported Sales in 2024, by Region
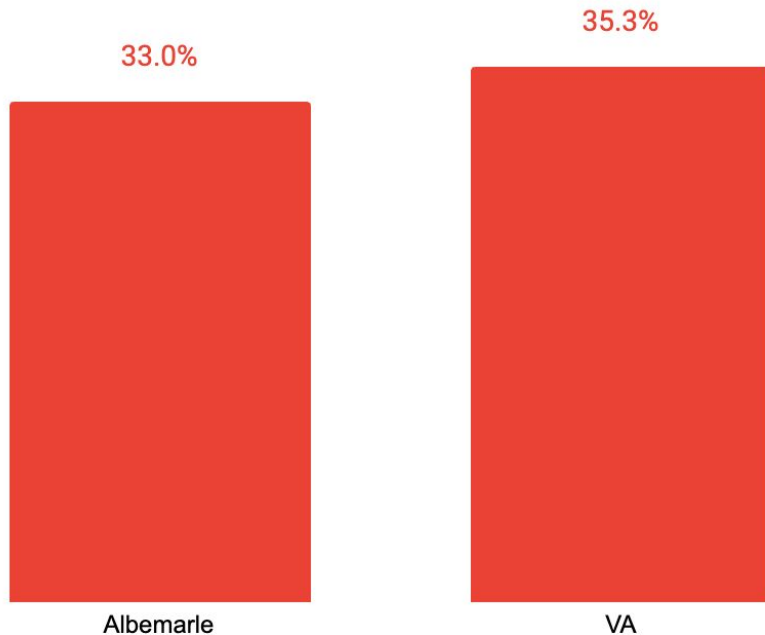
Source: Lightcast

Average industry earnings per job are 15% higher than the Commonwealth and 11% higher than the national average

Average Annual Earnings per Job in 2024, by Region

Source: Lightcast

**Average Annual Earnings per Job, by Year and Region**

■ 2019 ■ 2020 ■ 2021 ■ 2022 ■ 2023 ■ 2024

Source: Lightcast

Note: Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

resonance

Nearly 4 out of every 10 workers in the cluster are female - a slightly higher share than the state and nation
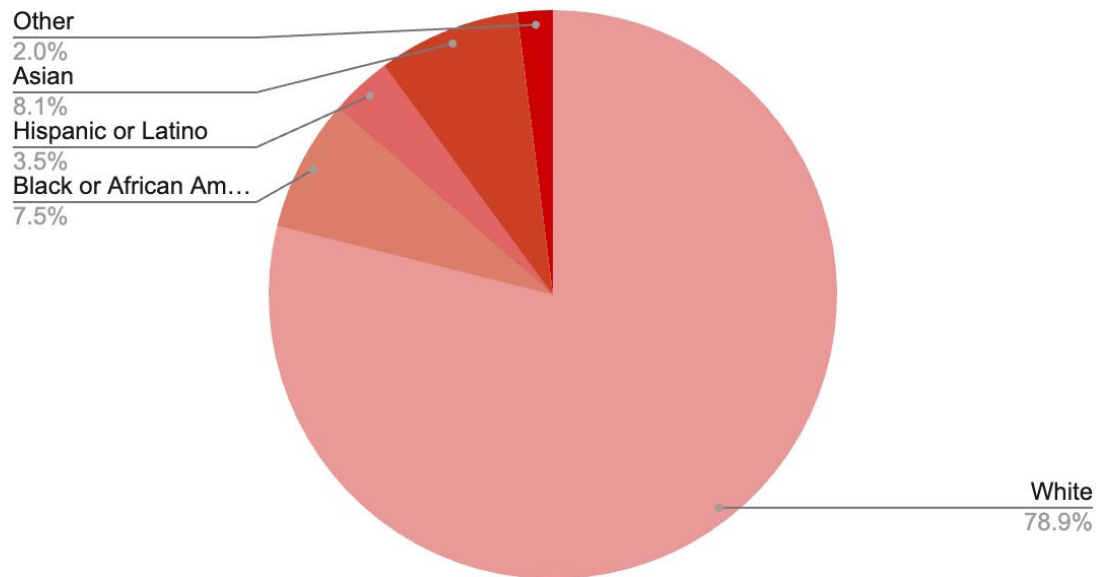
Composition of Males and Females in Cluster in 2024, by Region

■ Males ■ Females

38.3%

34.4%

37.7%

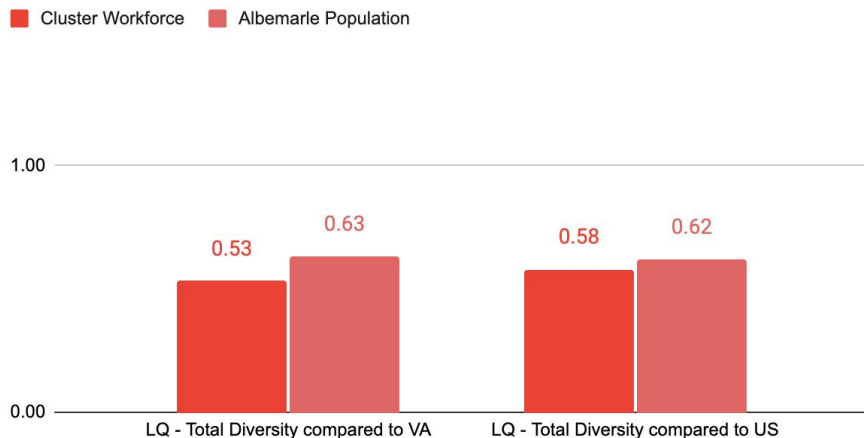Albemarle

VA

USA
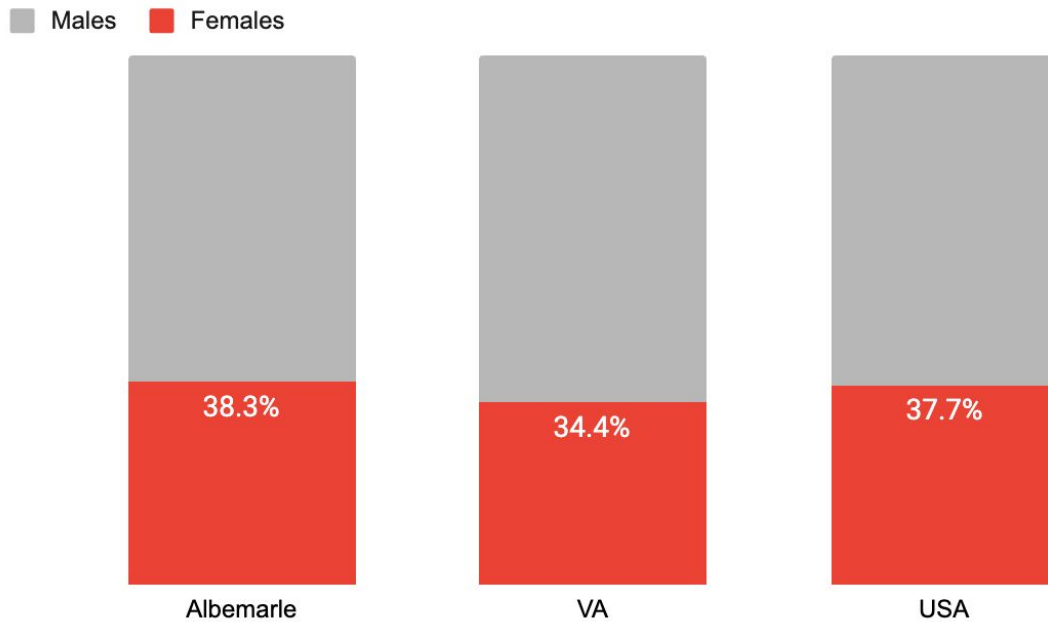
Source: Lightcast

Non-white workers account for 21% of the cluster's workforce - lower than the share of non-white residents in the county overall (26%)

Race/Ethnicity Composition of Cluster in 2024

Other
2.0%

Asian
8.1%

Hispanic or Latino
3.5%
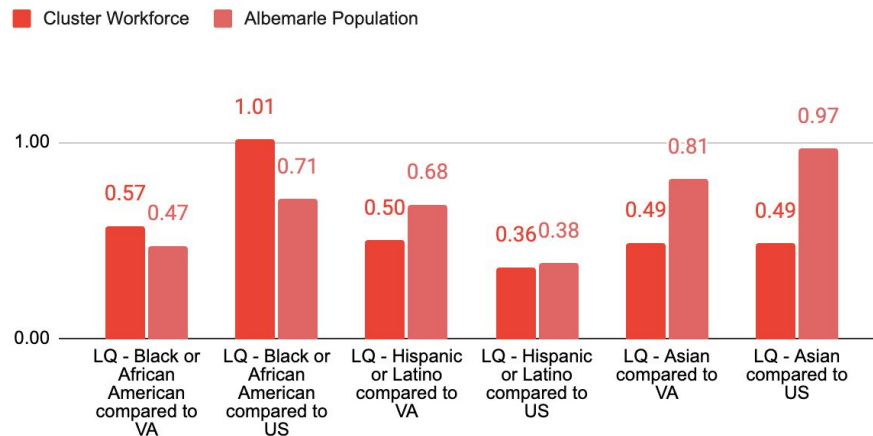
Black or African Am…
7.5%

White
78.9%

While the cluster is less diverse than the Commonwealth, the nation, and Albemarle overall, it has a larger share of Black or African American workers than the nation and the county

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population
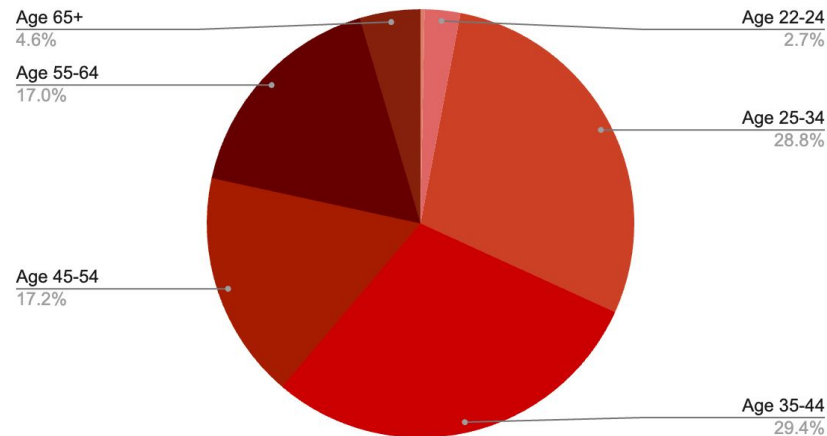
■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Note:the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.
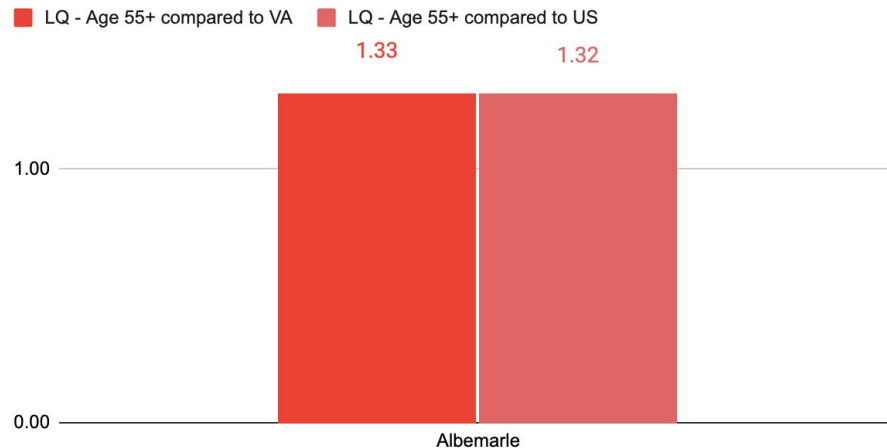
resonance

The cluster has a smaller share of workers over the age of 55 (22%) compared to the county overall (26%), but it has a higher share compared to the state and national average

Age Composition of Cluster in 2024

Age 65+
4.6%

Age 22-24
2.7%

Age 55-64
17.0%

Age 25-34
28.8%

Age 45-54
17.2%

Age 35-44
29.4%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA   ■ LQ - Age 55+ compared to US

1.33   1.32

1.00

0.00

Albemarle

Source: Lightcast

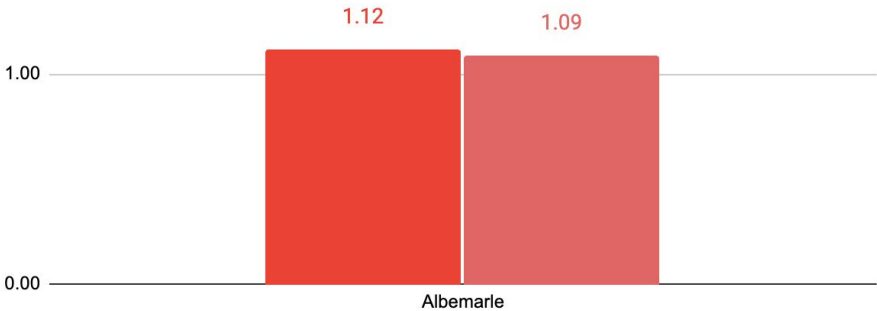# One of the most highly educated clusters, nearly 6 out of every 10 workers have a Bachelor's Degree or higher

Education Composition of Cluster in 2024

Doctorate
5.4%

Masters
14.9%

No College Degree
39.2%

Bachelors
39.2%

Associates
1.4%
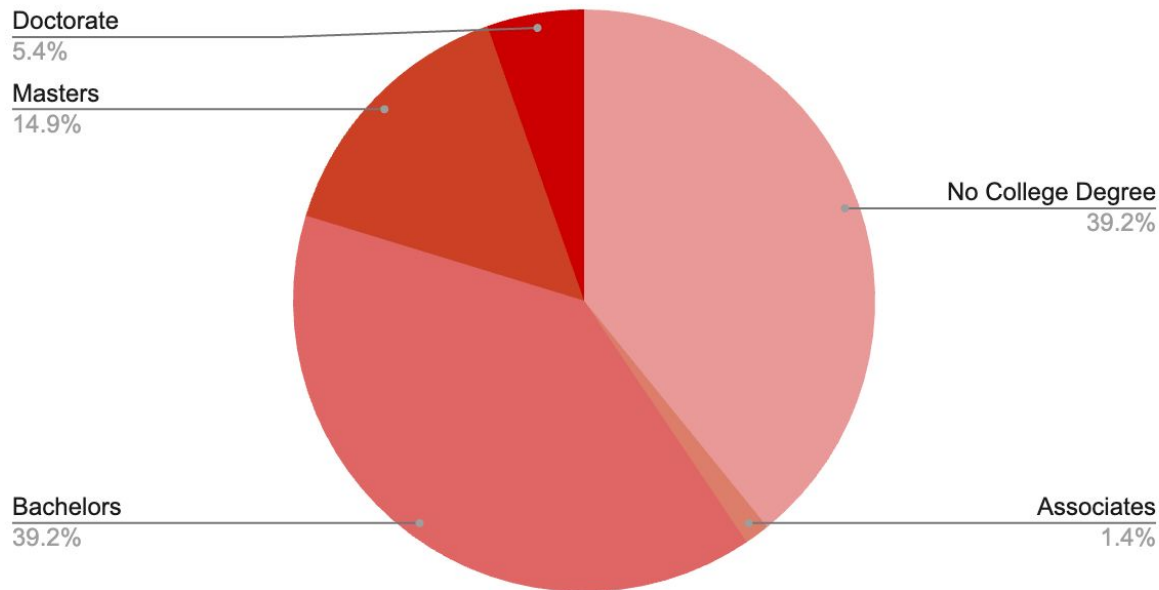
The cluster has a competitive advantage when it comes to those with a BA or higher

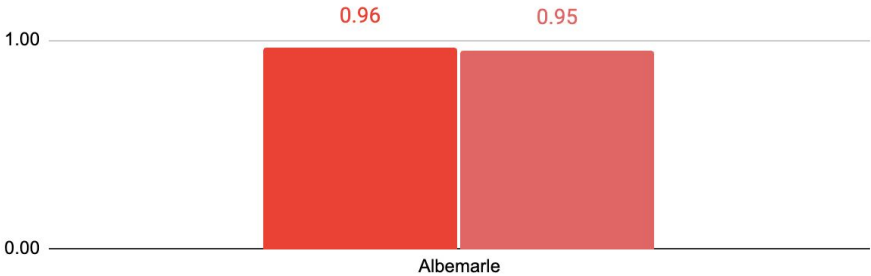**Location Quotients of Cluster Educational Attainment, 2024**

■ LQ - BA and above - VA　　■ LQ - BA and above - US

1.12　　1.09

1.00

0.00

Albemarle

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - Masters and above - VA　　■ LQ - Masters and above - US

0.96　　0.95

1.00

0.00

Albemarle

Source: Lightcast

resonance

At nearly 70%, the cluster is able to satisfy most of its supply chain requirements in the region
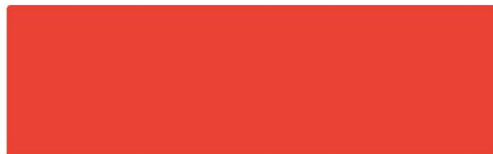
% of Demand Met In-Region

Source: Lightcast

resonance
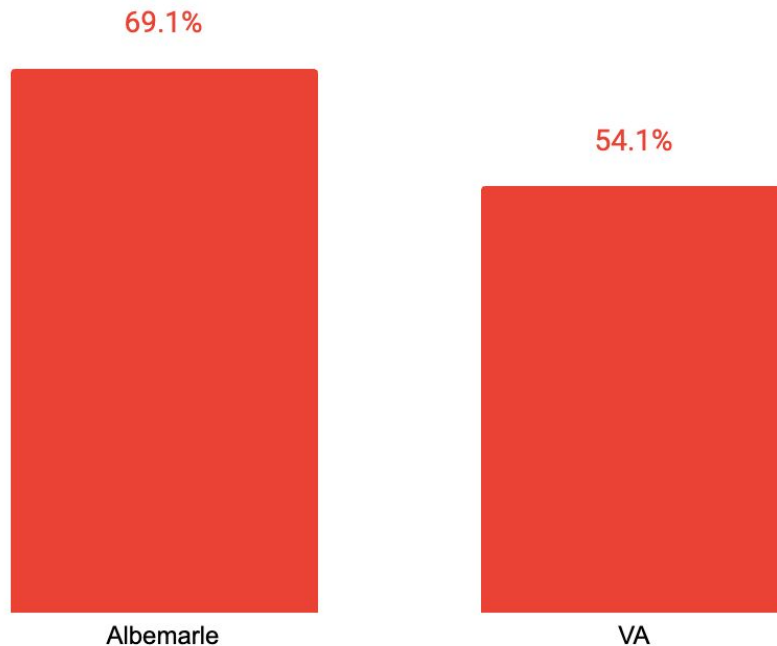
Occupations in the cluster face a relatively low risk of automation

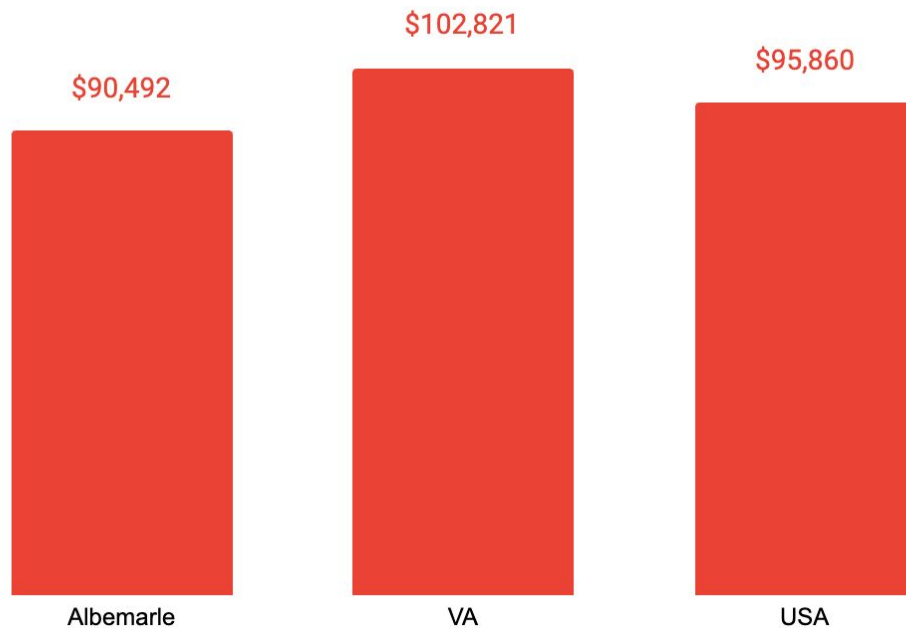% of Jobs at Risk of Automation

14.5%

Albemarle

Source: Lightcast

Median earnings for occupations in the cluster are 14% lower than the Commonwealth and 6% lower than the nation
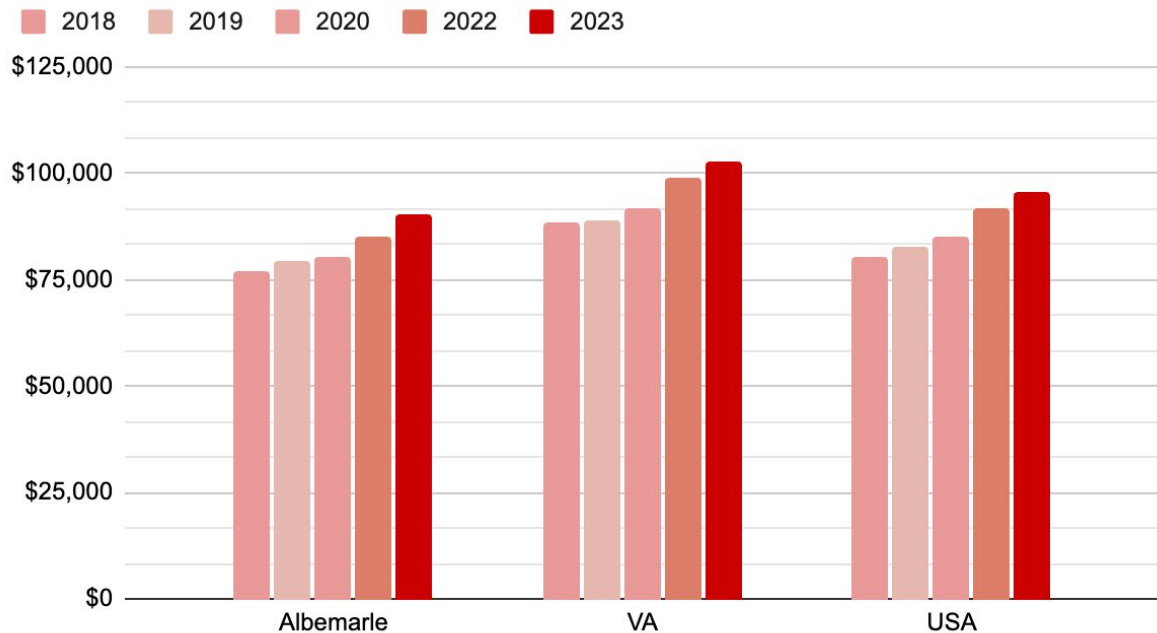
Median Annual Earnings in 2023, by Region

Source: Lightcast

Median earnings for occupations in the cluster grew 17% over the past 5 years, similar to the Commonwealth (16%) and the nation (19%)

Median Annual Earnings, by Year and Region

Legend: 2018, 2019, 2020, 2022, 2023

Source: Lightcast

06

Food Processing and Agribusiness

Overall LQ: 2.33
Total Employment: 2,147
Average Industry Earnings per Job: $46,092

Cluster Assets

- Local wineries, breweries, and distilleries

- Strong variety of crop (apples, grapes, peaches) and animal (beef, turkey, horses, goats) production

- Most competitive cluster

- Highest overall LQ (2.33) and largest employment cluster

- Highest share of sales exported out of region (83%)

Food Processing and Agribusiness

NAICS	Description	2024 Jobs	2019-2024 Job Growth	2019-2024 Job Growth %	% of jobs in this cluster	2024 Location Quotient	2024 Average Earnings Per Job	GRP (Millions)
111000	Crop Production	877	20	2.3%	40.9%	2.31	$36,925	$75.4
312130	Wineries	470	43	10.1%	21.9%	13.51	$43,457	$38.6
312111	Soft Drink Manufacturing	262	74	39.4%	12.2%	7.40	$67,892	$29.5
112000	Animal Production	160	-76	-32.2%	7.5%	0.81	$48,718	$17.1
321113	Sawmills	124	3	2.5%	5.8%	3.45	$72,649	$18.5
115115	Farm Labor Contractors and Crew Leaders	123	8	7.0%	5.7%	0.84	$34,909	$4.8
115210	Support Activities for Animal Production	68	-3	-4.2%	3.2%	3.65	$51,584	$5.1
115116	Farm Management Services	34	4	13.3%	1.6%	3.37	$68,222.00	$2.7
312120	Breweries	20	-10	-33.3%	0.9%	0.41	$53,598.00	$2.9
312140	Distilleries	5	4	400.0%	0.2%	0.43	$30,366.00	$1.5
113110	Timber Tract Operations	4	-1	-20.0%	0.2%	2.23	$54,902.00	$0.5
ABCV06	**Food Processing & Agribusiness**	**2,147**	**66**	**3.2%**	**100%**	**2.33**	**$46,092**	**$196.7**

The county has a strong competitive advantage in the cluster relative to the state and nation

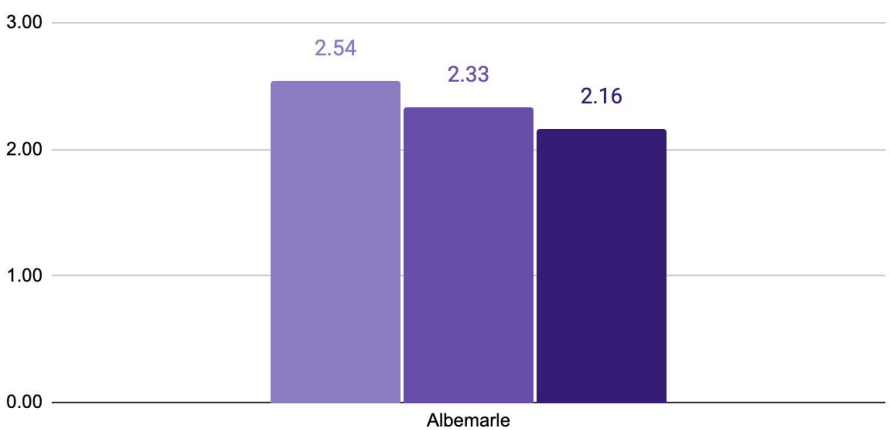LQ for % of Jobs in Cluster Compared to Virginia, by Year

■ 2019   ■ 2024   ■ 2029

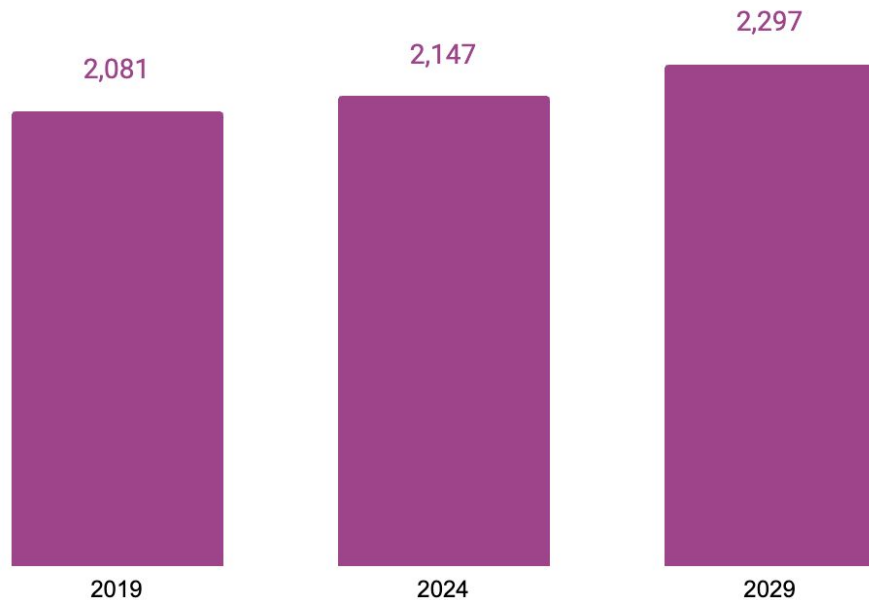Source: Lightcast

LQ for % of Jobs in Cluster Compared to US, by Year

■ 2019   ■ 2024   ■ 2029

Source: Lightcast

resonance
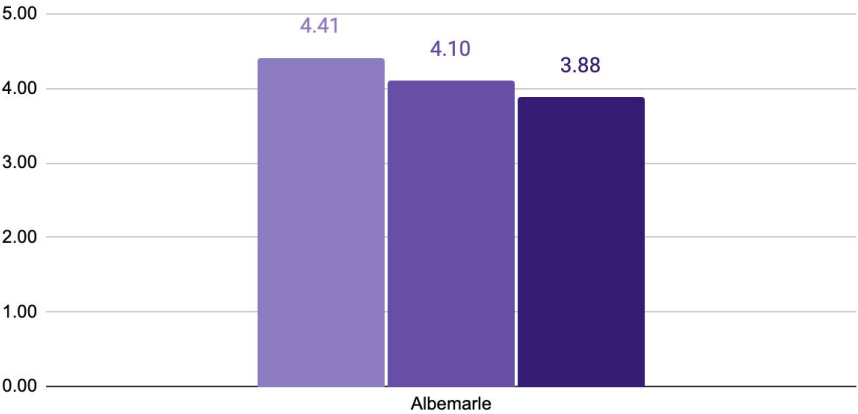
The supply of jobs increased 3% over the past 5 years and is projected to increase 7% in the next 5 years
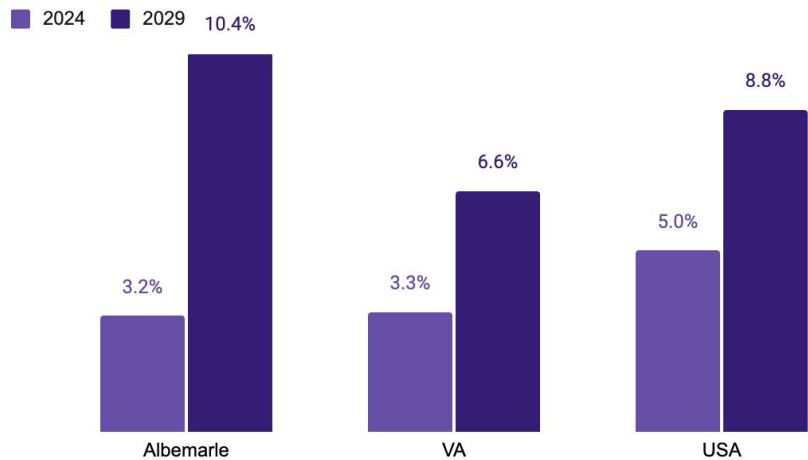
Total Employment in Cluster, by Year

Source: Lightcast

The regional cluster grew slightly slower than the national average, but is projected to outpace the nation and state over the next 5 years

**Cumulative Growth in Employment since 2019, Scaled by Region Size**

■ 2024   ■ 2029


Source: Lightcast

Region	2019-2024 % Job Growth	2024-2029 % Job Growth	% Change (2019 - 2029)
Albemarle	3.2%	7.0%	**10.4%**
VA	3.3%	3.2%	**6.6%**
USA	5.0%	3.7%	**8.8%**

resonance

Wineries and Soft Drink Manufacturing have seen the largest increases in jobs and have the strongest competitive advantage. Animal Production had the largest decrease in jobs

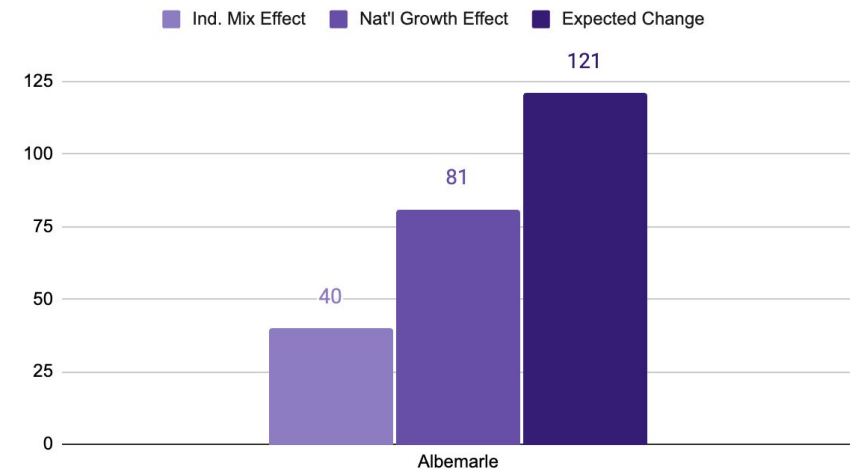5-Year Job Growth by LQ for Industries in Cluster (LQs >3)
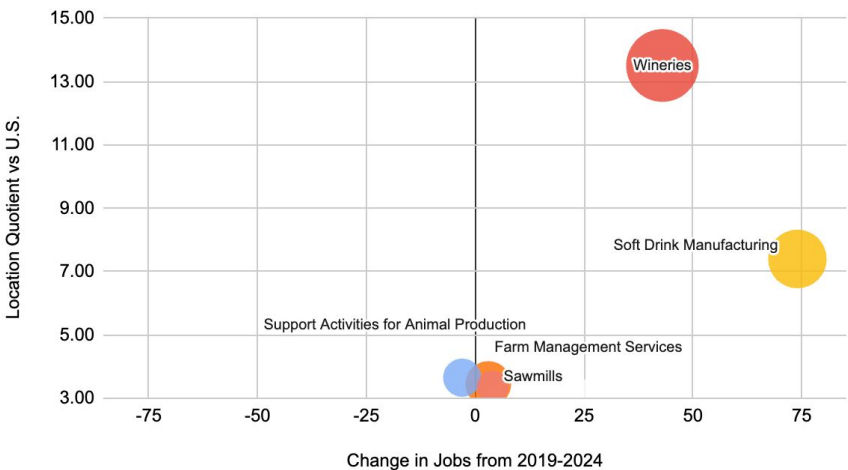
5-Year Job Growth by LQ for Industries in Cluster (LQs <3)
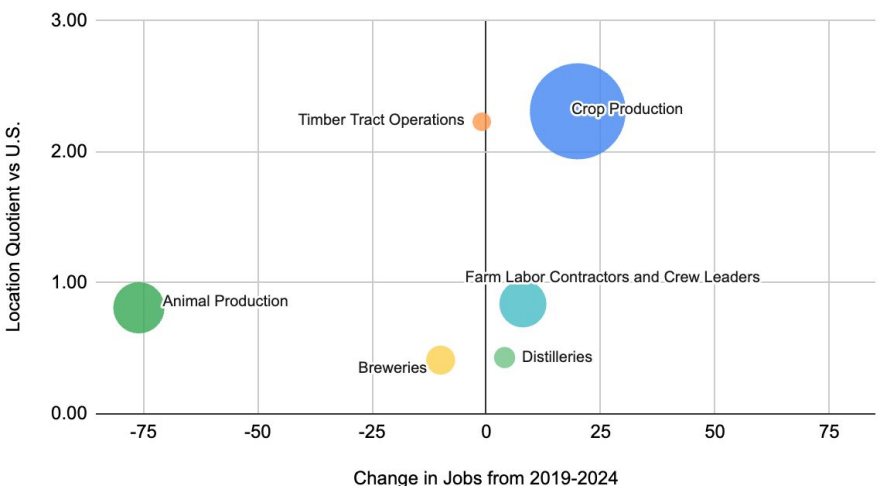
Note: Size of each bubble is based on the size of employment in 2024.
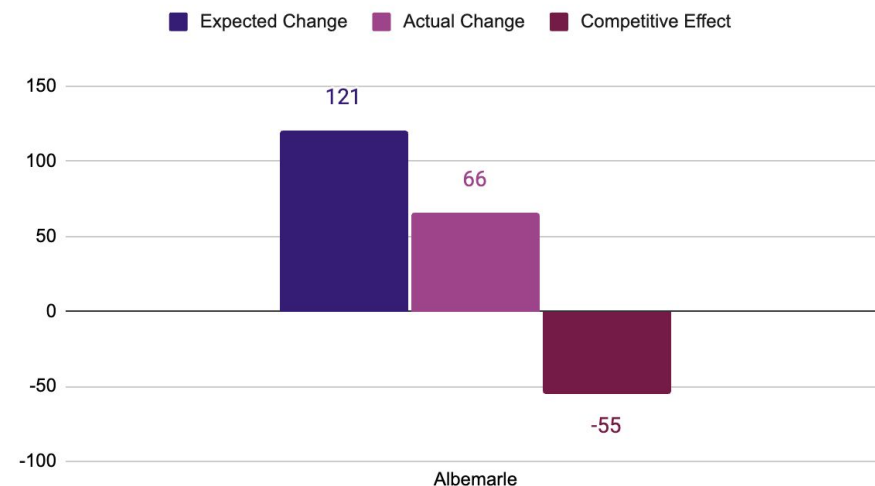
resonance

The cluster was expected to gain nearly 120 jobs largely based on national industry and economic trends, but gained only half as many - meaning the region had a negative competitive effect

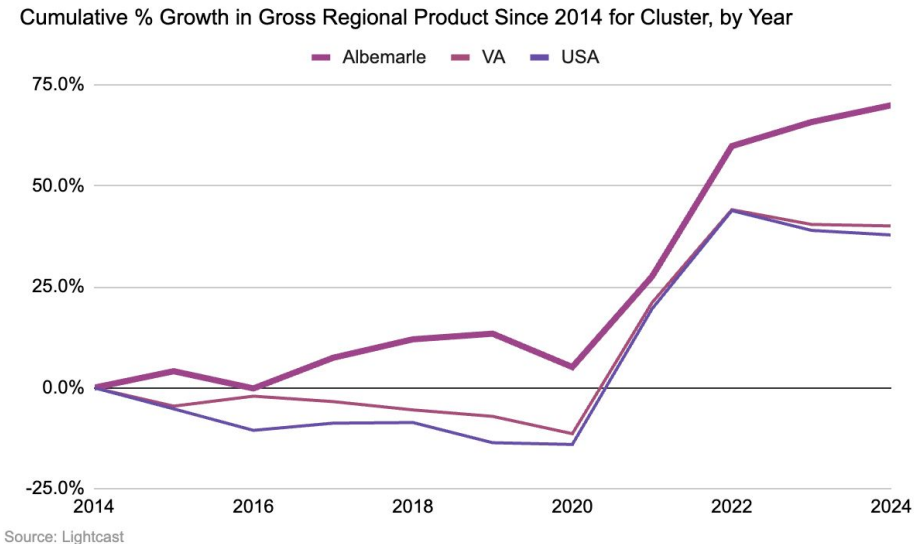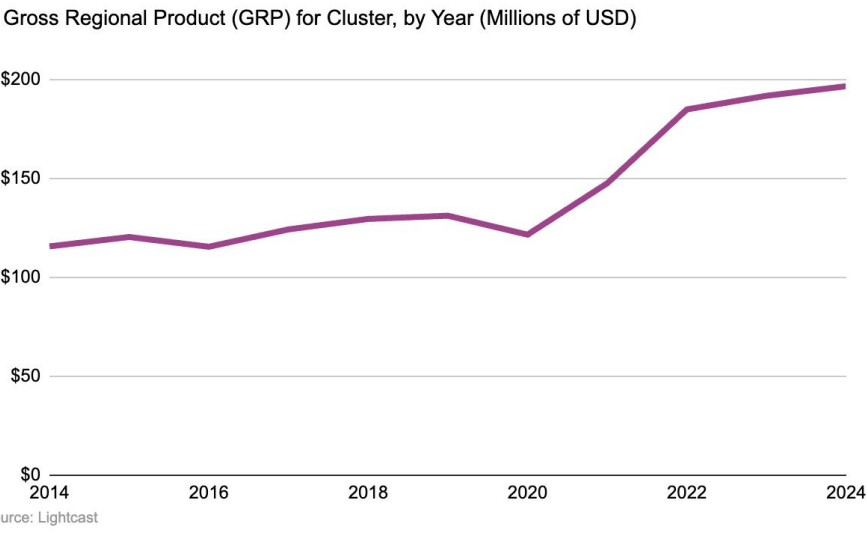**Composition of Expected Change in Jobs from 2019-2024**

Ind. Mix Effect — Nat'l Growth Effect — Expected Change

Albemarle: 40, 81, 121

Source: Lightcast

Expected vs Actual Change in Jobs from 2019-2024

Expected Change — Actual Change — Competitive Effect

Albemarle: 121, 66, -55

Source: Lightcast

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The cluster's GRP grew 75% over the past decade - outpacing the nation and state

Gross Regional Product (GRP) for Cluster, by Year (Millions of USD)

Source: Lightcast

Cumulative % Growth in Gross Regional Product Since 2014 for Cluster, by Year

— Albemarle   — VA   — USA

Source: Lightcast

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The cluster's GRP per worker grew 45% over the past 5 years - slightly slower than the nation overall (52%)

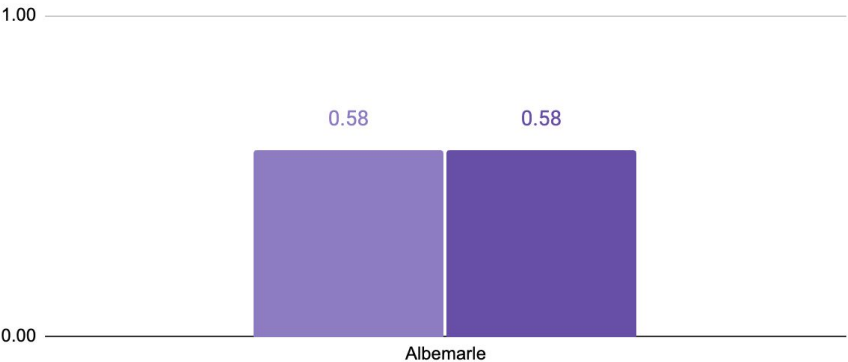### GRP per Worker, by Region and Year
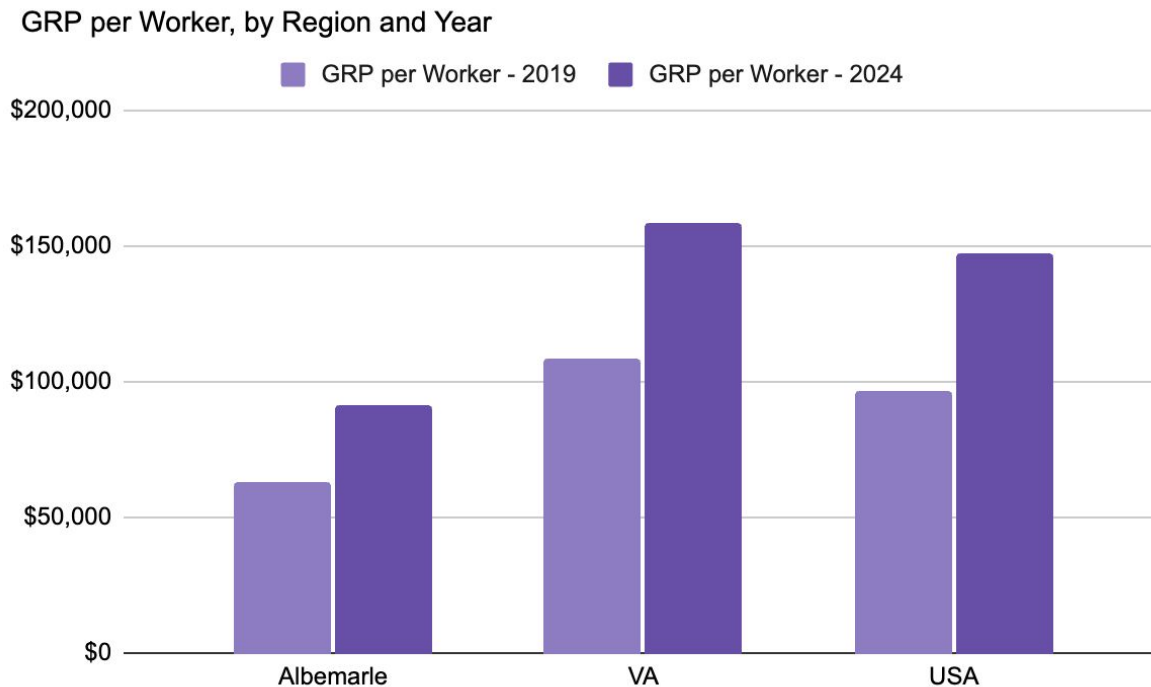
Source: Lightcast

The cluster does not have a competitive advantage over the state and nation in its economic productivity

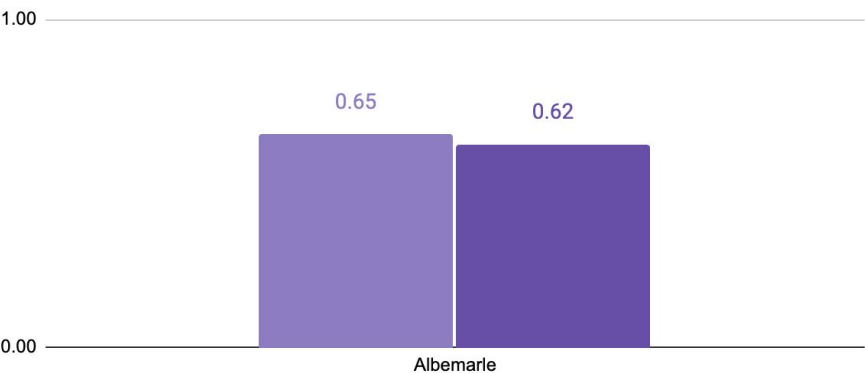Location Quotient for GRP per Worker Compared to Virginia, by Year

■ 2019   ■ 2024

Source: Lightcast

Location Quotient for GRP per Worker Compared to the U.S., by Year

■ 2019   ■ 2024

Source: Lightcast

resonance

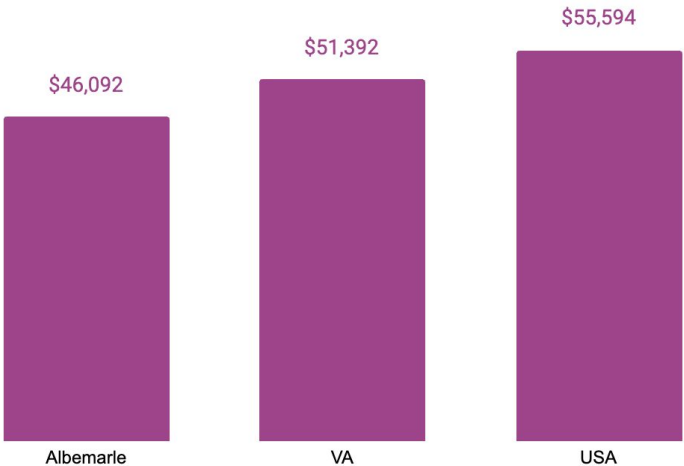# The cluster exports over $8 out of every $10 in sales outside of the region - enhancing its competitiveness

% of Exported Sales in 2024, by Region

82.7%

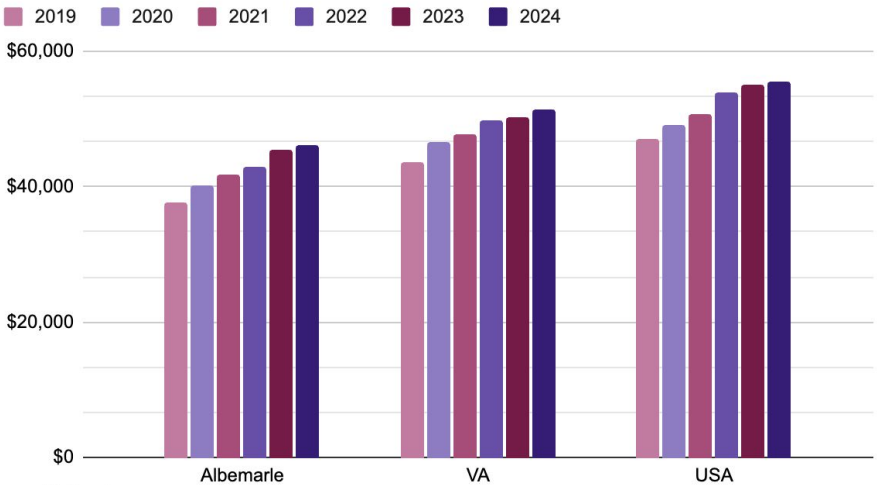66.9%

Albemarle

VA

Source: Lightcast

Average industry earnings per job are 12% lower than the Commonwealth and 21% lower than the national average

Average Annual Earnings per Job in 2024, by Region

$46,092 — Albemarle
$51,392 — VA
$55,594 — USA

Source: Lightcast

Average Annual Earnings per Job, by Year and Region

Legend: 2019, 2020, 2021, 2022, 2023, 2024

Source: Lightcast

Note:Industry earnings per job include earnings for employees or what the owner of a company pays his or herself plus the value of pensions, insurance plans, retirement plans, employer contributions for government social insurance, and other supplements. It is not a measure for "average salary," but rather used to indicate overall quality of jobs in each industry.

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Nearly 4 out of every 10 workers in the cluster are female - a higher share than the state and nation
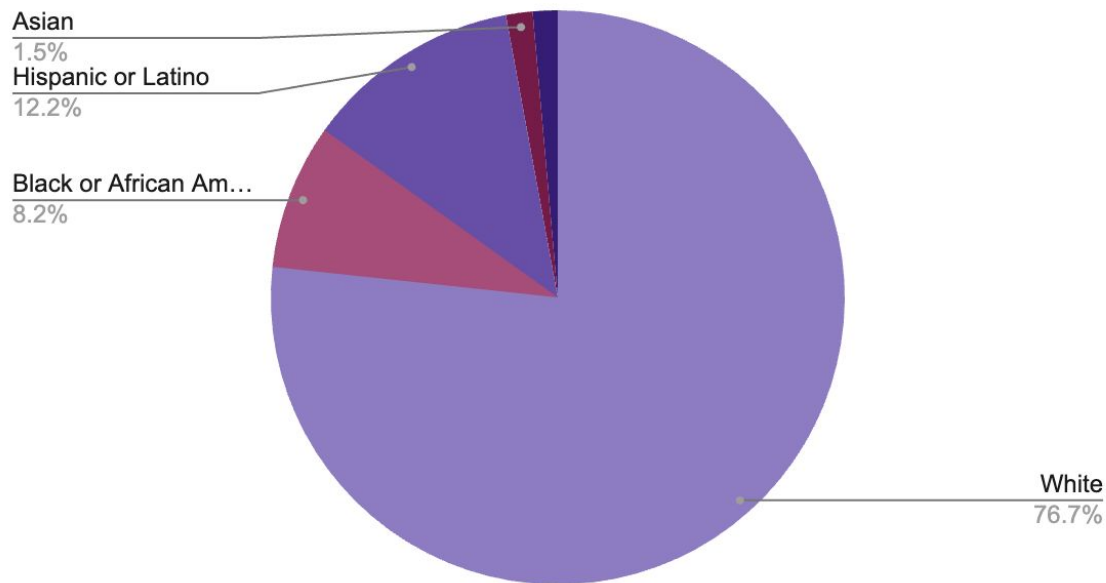
Composition of Males and Females in Cluster in 2024, by Region

Males   Females

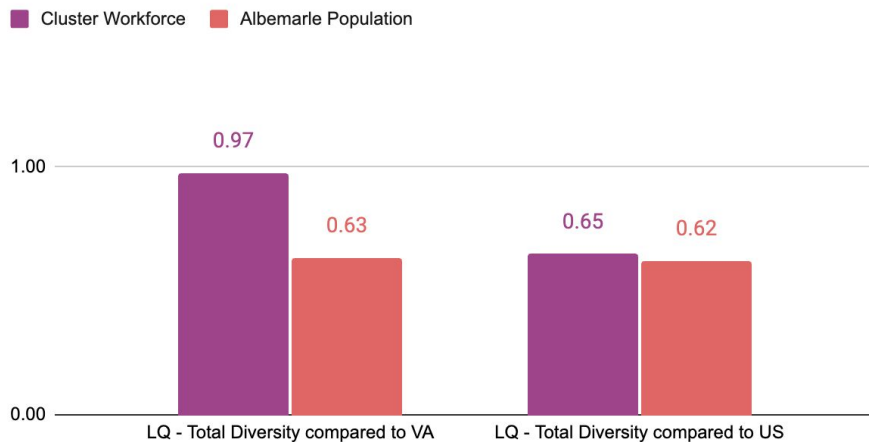| Albemarle	VA	USA
38.4%	32.9%	31.5%
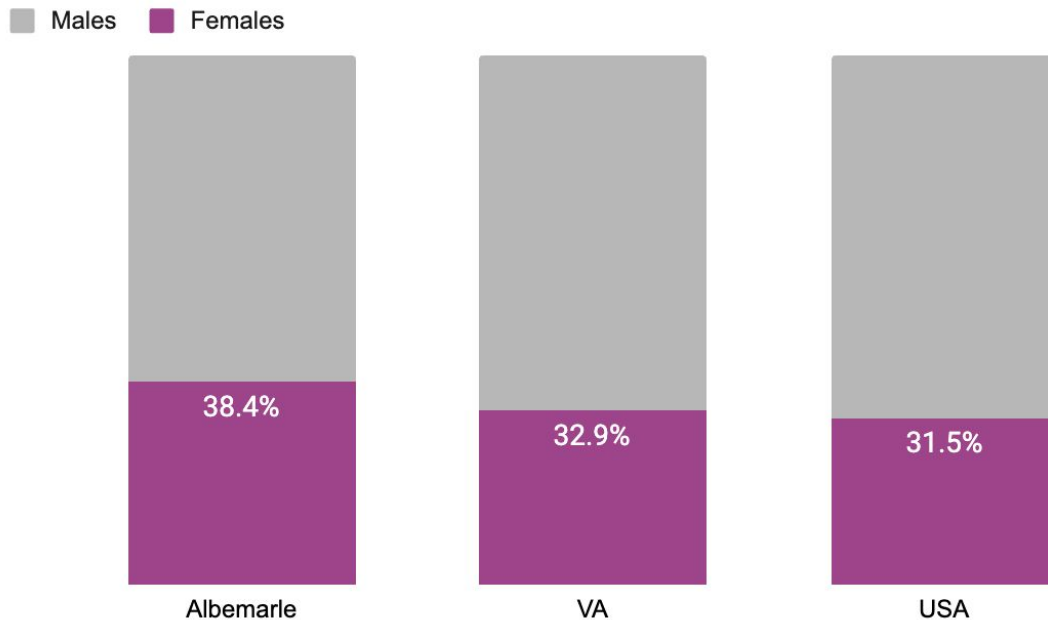
Source: Lightcast

Non-white workers account for 23% of the cluster's workforce - lower than the share of non-white residents in the county overall (26%)

Race/Ethnicity Composition of Cluster in 2024

Asian
1.5%

Hispanic or Latino
12.2%

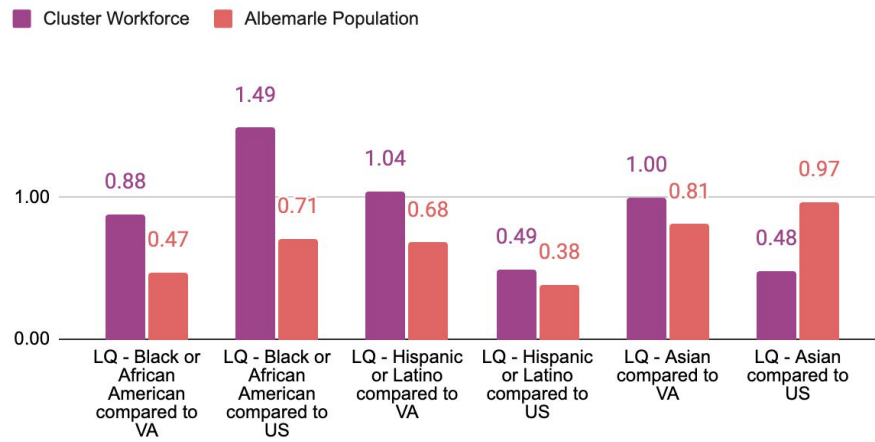Black or African Am...
8.2%

White
76.7%

While the cluster is less diverse than the Commonwealth, the nation, and Albemarle overall, it has a larger share of Black or African American workers than the nation and the county

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population

■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Location Quotients of Diversity in Cluster vs Diversity in Albemarle Population
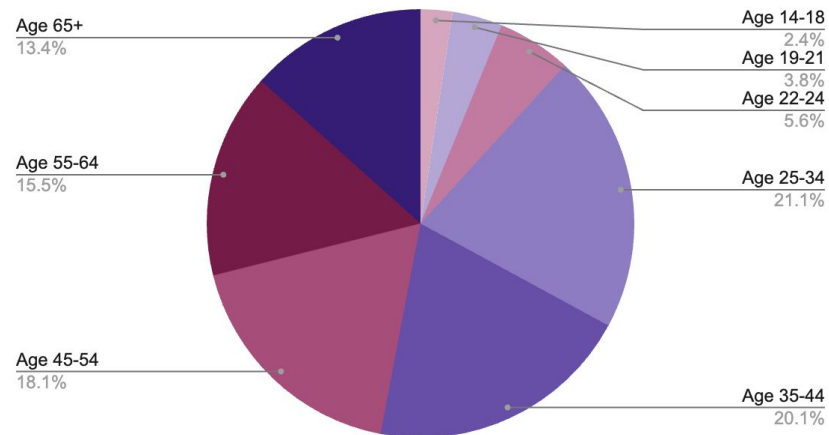
■ Cluster Workforce   ■ Albemarle Population

Source: Lightcast

Note:the LQ value for Albemarle Population is the expected diversity given the county's racial/ethnic composition compared to the state or nation; If the LQ value for the Cluster Workforce is higher than the LQ for Albemarle Population, it means the cluster is more diverse in that racial/ethnic group than would be expected given the county's demographics. An LQ of more than 1 means it has higher share of workers in that racial/ethnic group relative to the state or national average overall.
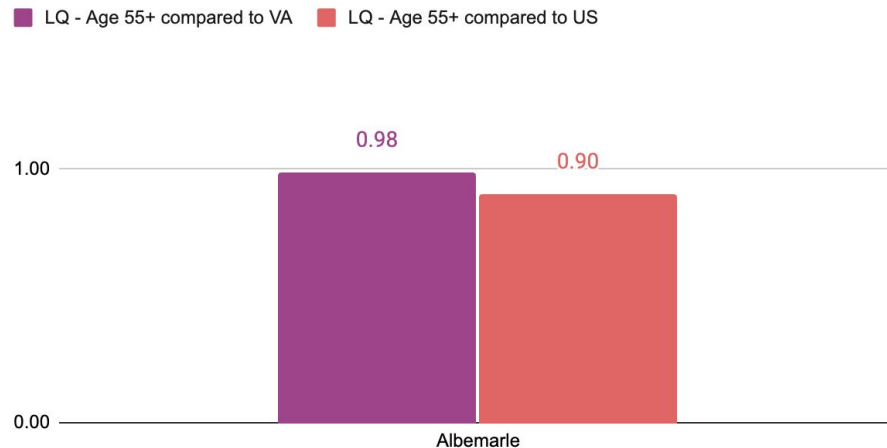
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The cluster has a larger share of workers over the age of 55 (29%) compared to the county overall (26%), but it has a lower share compared to the state and national average

Age Composition of Cluster in 2024

Age 65+ 13.4%
Age 55-64 15.5%
Age 45-54 18.1%
Age 35-44 20.1%
Age 25-34 21.1%
Age 22-24 5.6%
Age 19-21 3.8%
Age 14-18 2.4%

Location Quotients of Cluster Workforce Age 55+, 2024

■ LQ - Age 55+ compared to VA   ■ LQ - Age 55+ compared to US

0.98   0.90

Albemarle

Source: Lightcast

Around 4 out of every 10 workers have a Bachelor's Degree or higher

Education Composition of Cluster in 2024

Masters
18.2%

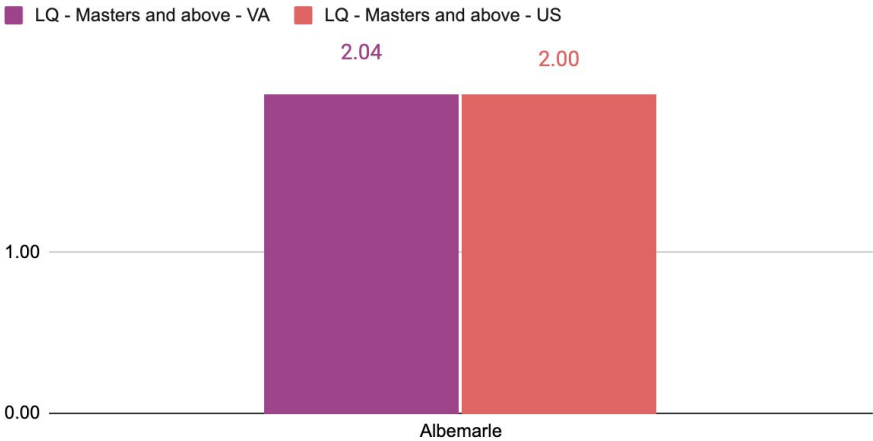Bachelors
23.4%

Associates
1.3%

No College Degree
57.1%
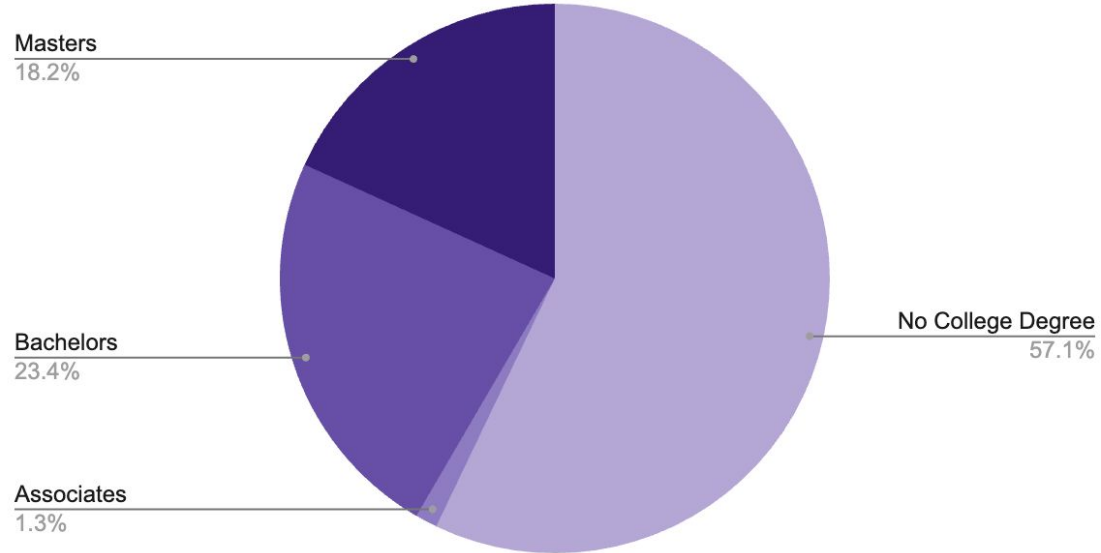
The cluster has a higher educational attainment than at the state or national level

Location Quotients of Cluster Educational Attainment, 2024
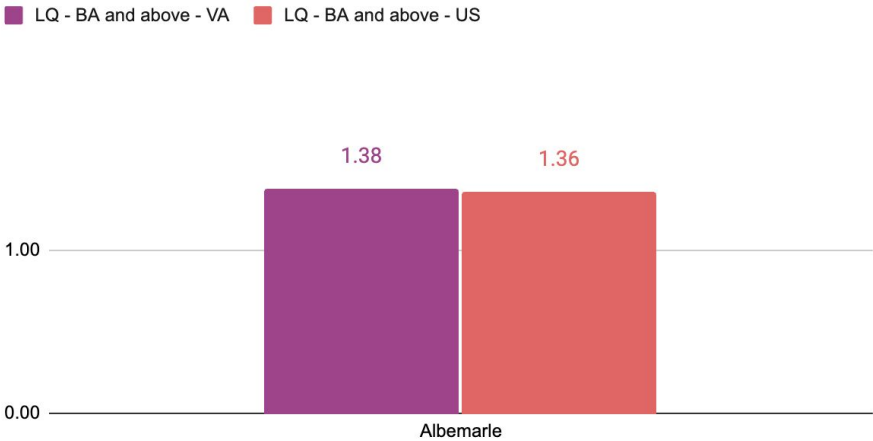
■ LQ - BA and above - VA   ■ LQ - BA and above - US

1.38   1.36

1.00

0.00

Albemarle

Source: Lightcast

Location Quotients of Cluster Educational Attainment, 2024

■ LQ - Masters and above - VA   ■ LQ - Masters and above - US

2.04   2.00

1.00

0.00

Albemarle

Source: Lightcast

**Food Processing and Agribusiness
Resilience**

The cluster is able to satisfy around one-half of its supply chain requirements in the region - almost twice the share as the state

% of Demand Met In-Region

52.8%

28.7%

Albemarle

VA

Source: Lightcast

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Around 6 out of 10 jobs face risk of automation

% of Jobs at Risk of Automation

60.1%

Albemarle

Source: Lightcast
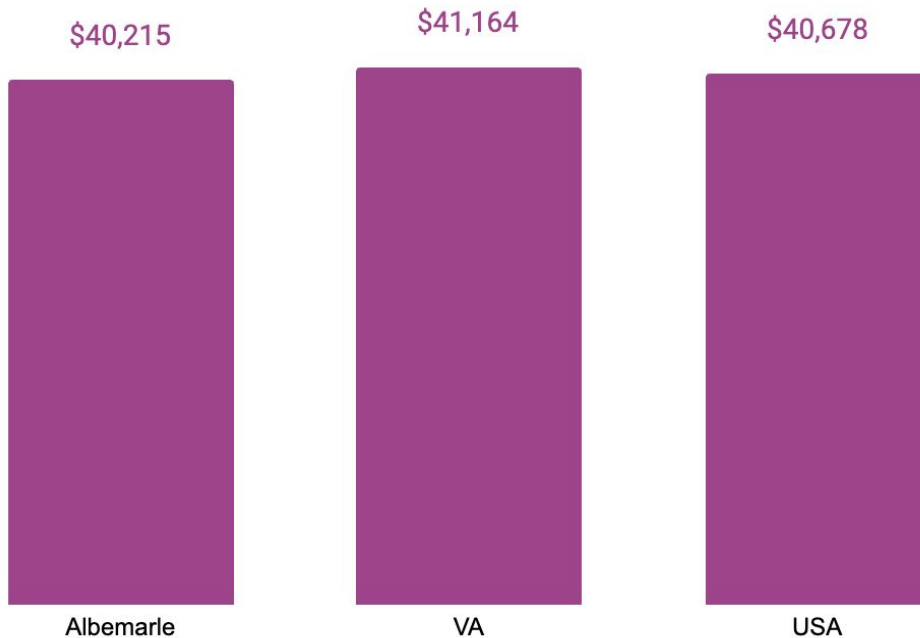
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# Median earnings for occupations in the cluster are on par with the Commonwealth and the nation

Median Annual Earnings in 2023, by Region

$40,215 — Albemarle

$41,164 — VA

$40,678 — USA

Source: Lightcast

Median earnings for occupations in the cluster grew 18% over the past 5 years, similar to the Commonwealth (18%) and the nation (21%)

Median Annual Earnings, by Year and Region

■ 2018   ■ 2019   ■ 2020   ■ 2022   ■ 2023
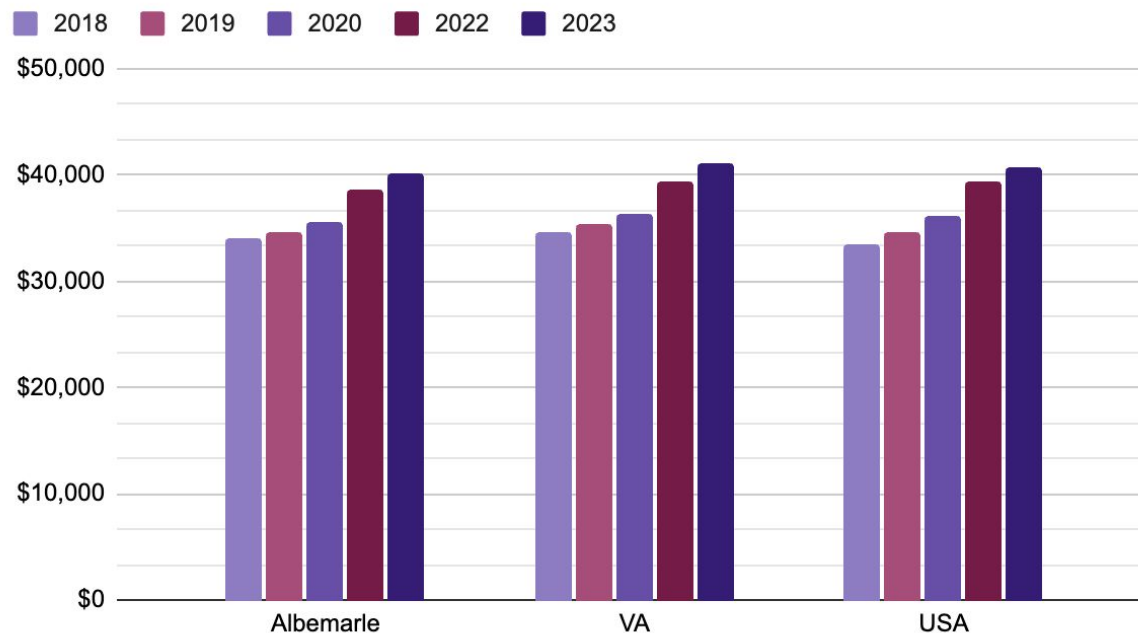
Source: Lightcast

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your place together.

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