High Tech in Oregon

Future Ready High Tech Consortium
November 14, 2023

What Makes 'High Tech' High Tech?

- Classification is based on the percentage of jobs in an industry that are in Science, Technology, Engineering, or Math (STEM).

- The average STEM concentration of an industry in the United States is around 6%.

- Industries with a concentration 5 times above and higher were designated as **core** high tech, and industries with a concentration 2.5 times and above this level were designated as peripheral high tech.

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Core High Tech

2022 Core High Tech Employment and Wages in Oregon

Industry Sector	Employment	Payroll	Annual Avg. Wage	Location Quotient	Location Quotient Rank
Total Core High-Tech Employment	**102,149**	**$13,613,731,498**	**$133,274**		
Pharmaceutical and Medicine Manufacturing	1,250	$98,344,090	$78,670	0.28	42
Computer and Peripheral Equipment Manufacturing	1,197	$110,066,765	$91,971	0.57	10
Communications Equipment Manufacturing	441	$39,923,584	$90,495	0.39	29
Audio and Video Equipment Manufacturing	752	$60,214,750	$80,126	2.99	2
Semiconductor and Other Electronic Component Mfg.	33,839	$5,467,870,360	$161,584	6.75	1
Navigational, Measuring, Electromedical, and Control Instruments Mfg.	4,797	$495,812,752	$103,366	0.87	18
Aerospace Product and Parts Manufacturing	3,050	$277,515,645	$90,976	0.47	23
Software Publishers	14,260	$2,114,516,969	$148,282	1.74	4
Architectural, Engineering, and Related Services	18,420	$1,722,711,309	$93,526	0.89	24
Computer Systems Design and Related Services	17,706	$2,488,740,456	$140,560	0.55	36
Scientific Research and Development Services	6,437	$738,014,818	$114,648	0.56	24

Source: Oregon Employment Department, Quarterly Census of Employment & Wages

Core high tech makes up 6.1% of total private-sector employment in Oregon, and 12.4% of total payroll.

Wages are twice the statewide average ($65,389).

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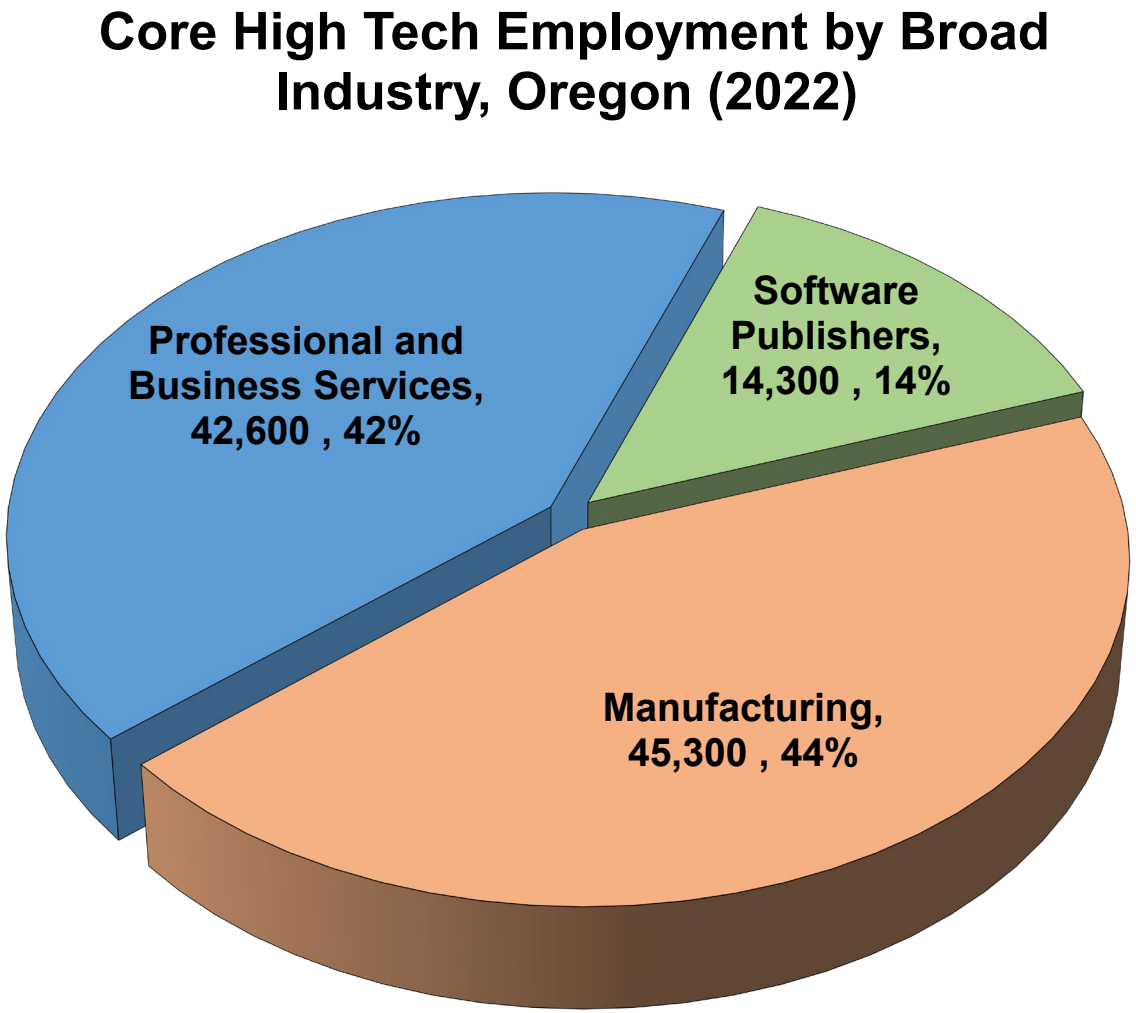
Three main components



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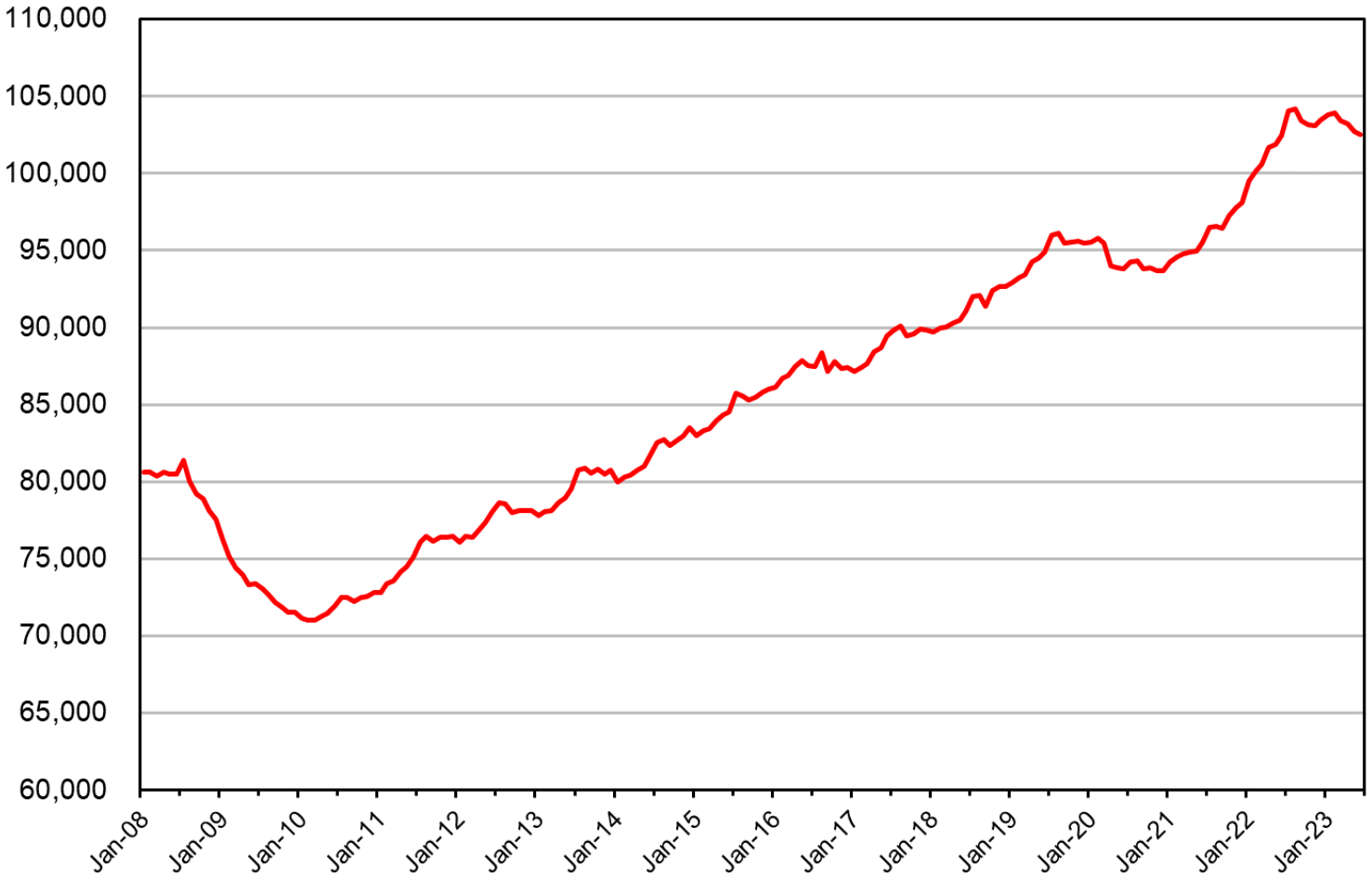
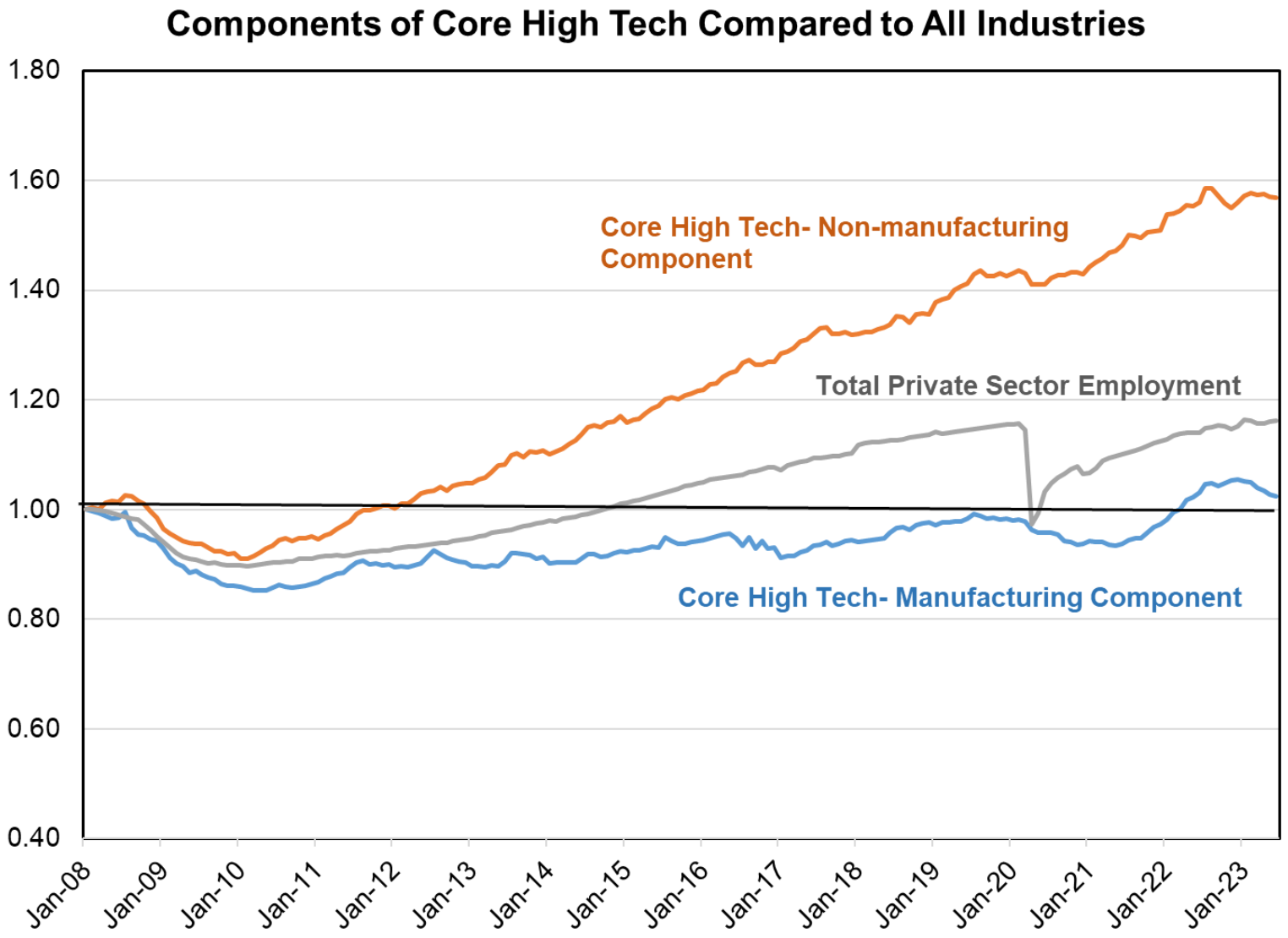
Oregon's Core High-Tech Employment



Source: Oregon Employment Department, Quarterly Census of Employment & Wages

State of Oregon Employment Department

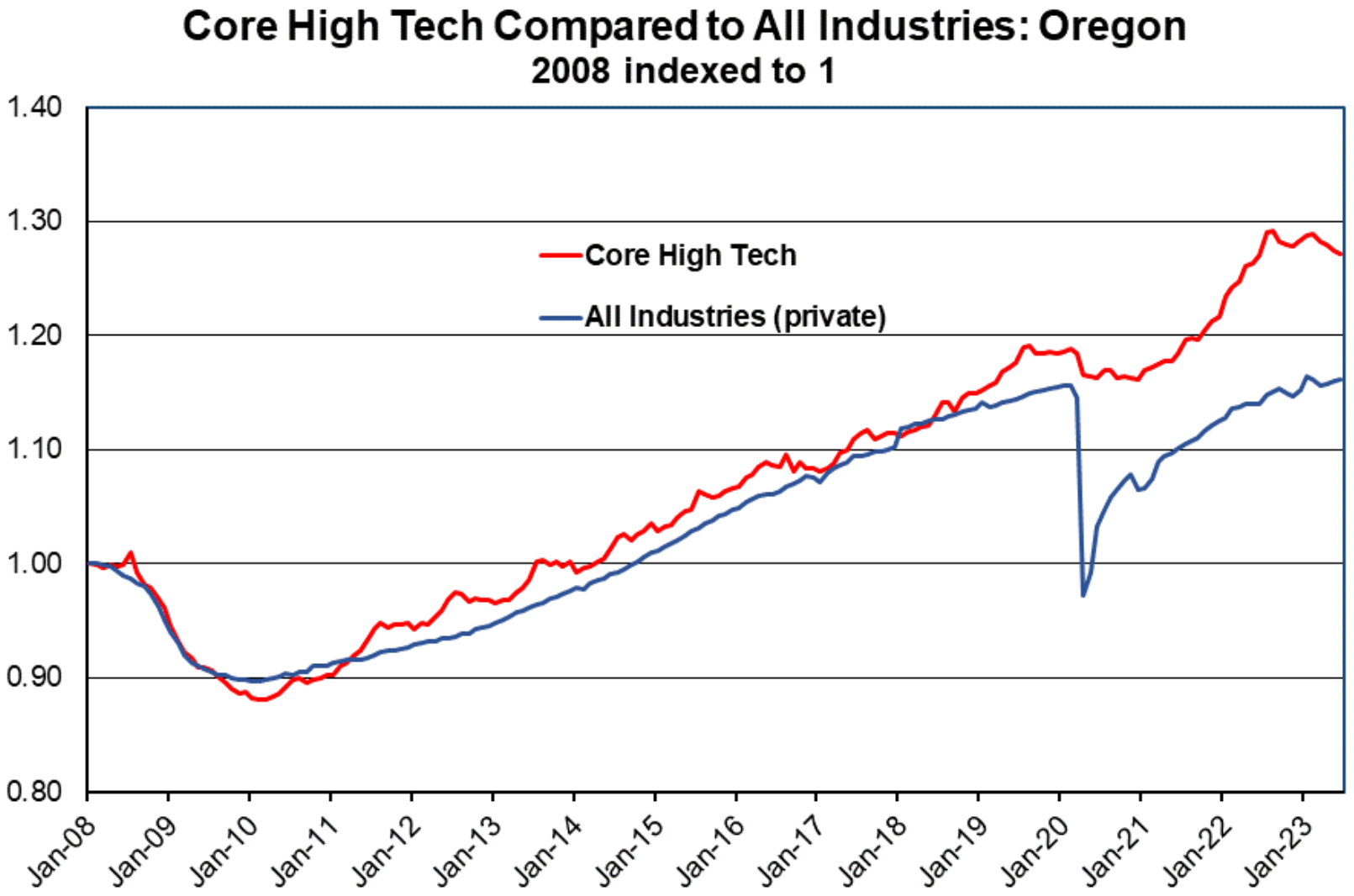
CORE HIGH TECH GROWTH OUTPERFORMS ALL INDUSTRIES OVER THE LONG TERM.



The non-manufacturing components of core high tech have propelled most of the growth over the past 15 years.

The manufacturing component reached a 25-year high in 2022.

CORE HIGH TECH JOB GROWTH OUTPERFORMS ALL INDUSTRIES OVER TIME.



Source: Oregon Employment Department, Quarterly Census of Employment & Wages and Current Employment Statistics

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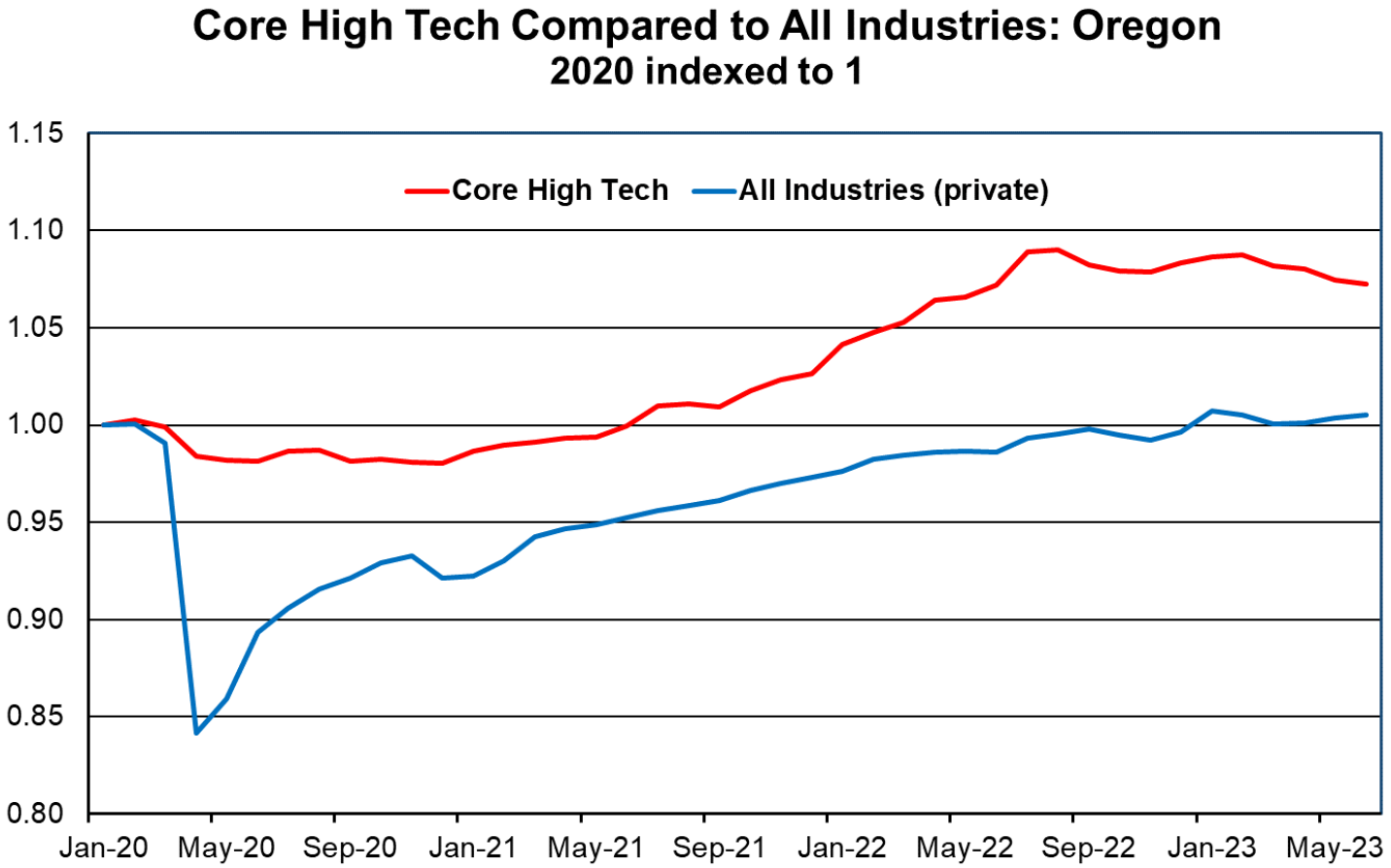
CORE HIGH TECH IS FULLY RECOVERED FROM PANDEMIC RECESSION.



Core High Tech lost 1,800 jobs in the first few months of the pandemic, or -1.9%

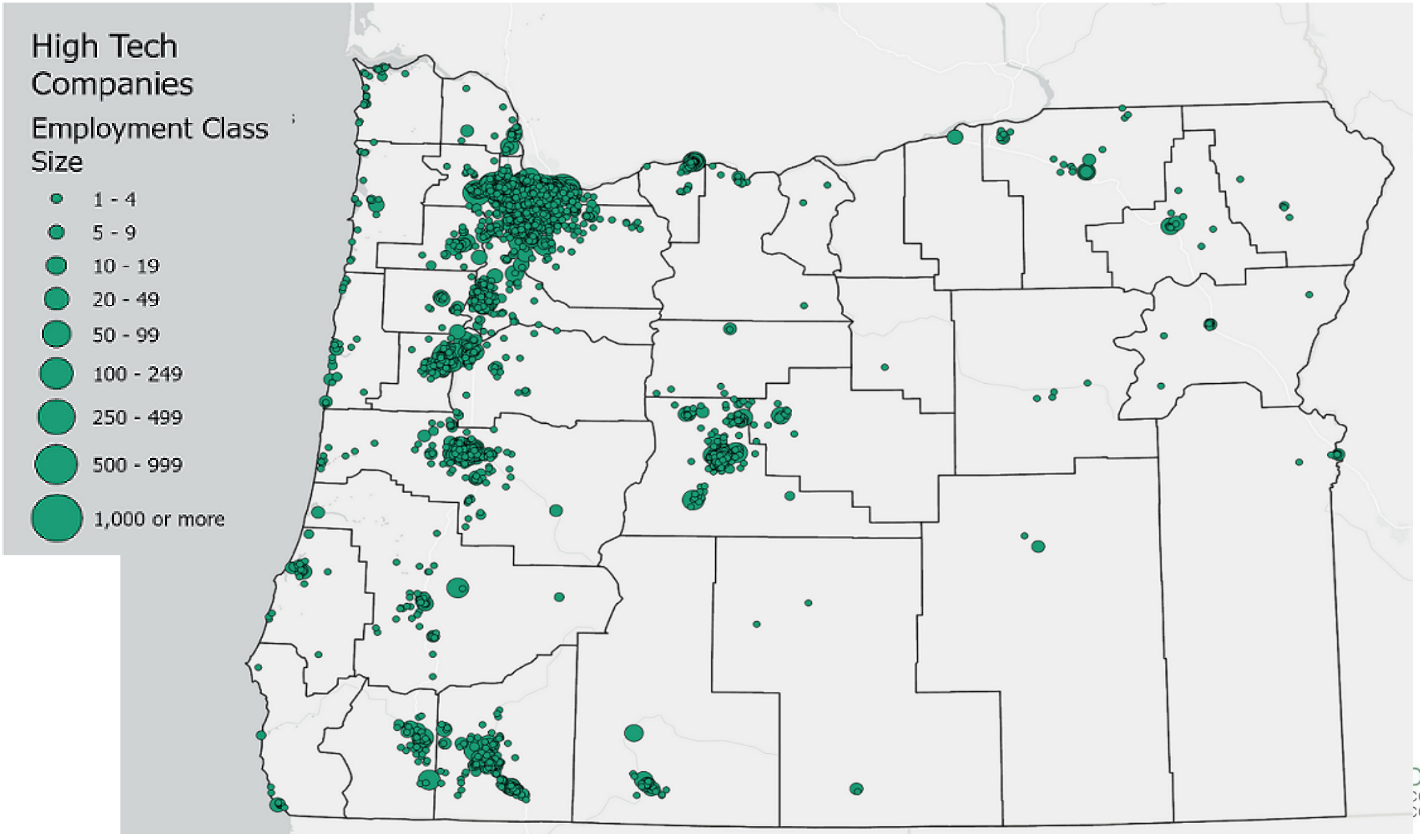
No real recovery for nearly a year

Full recovery in June 2021, 7,000 new jobs since (+7%)

Source: Oregon Employment Department, Quarterly Census of Employment & Wages and Current Employment Statistics

State of Oregon Employment Department

Where is Core High Tech?



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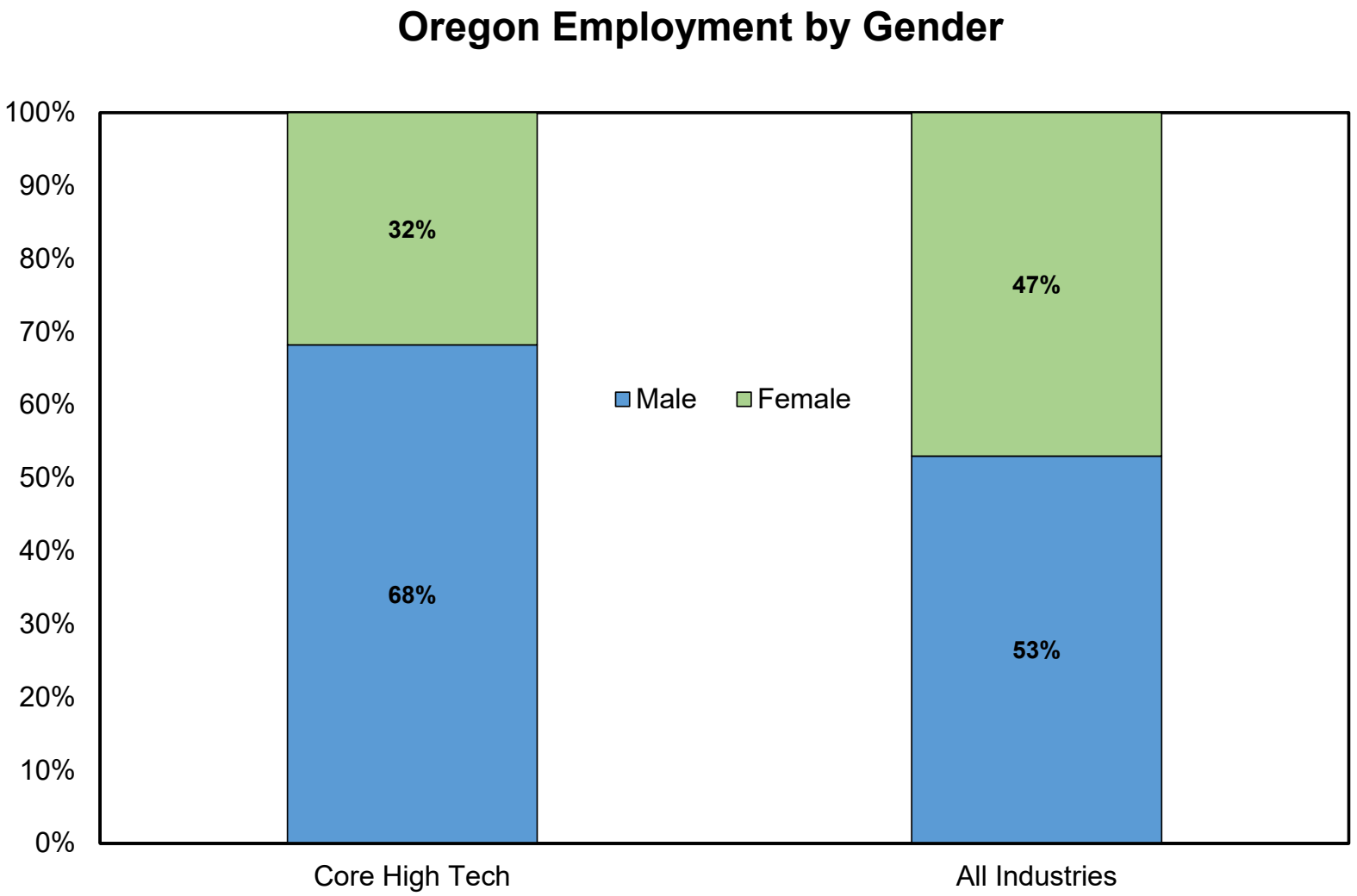
Core High Tech Industry Workforce Demographics: Gender



Source: U.S. Census Bureau, Quarterly Workforce Indicators, 2021

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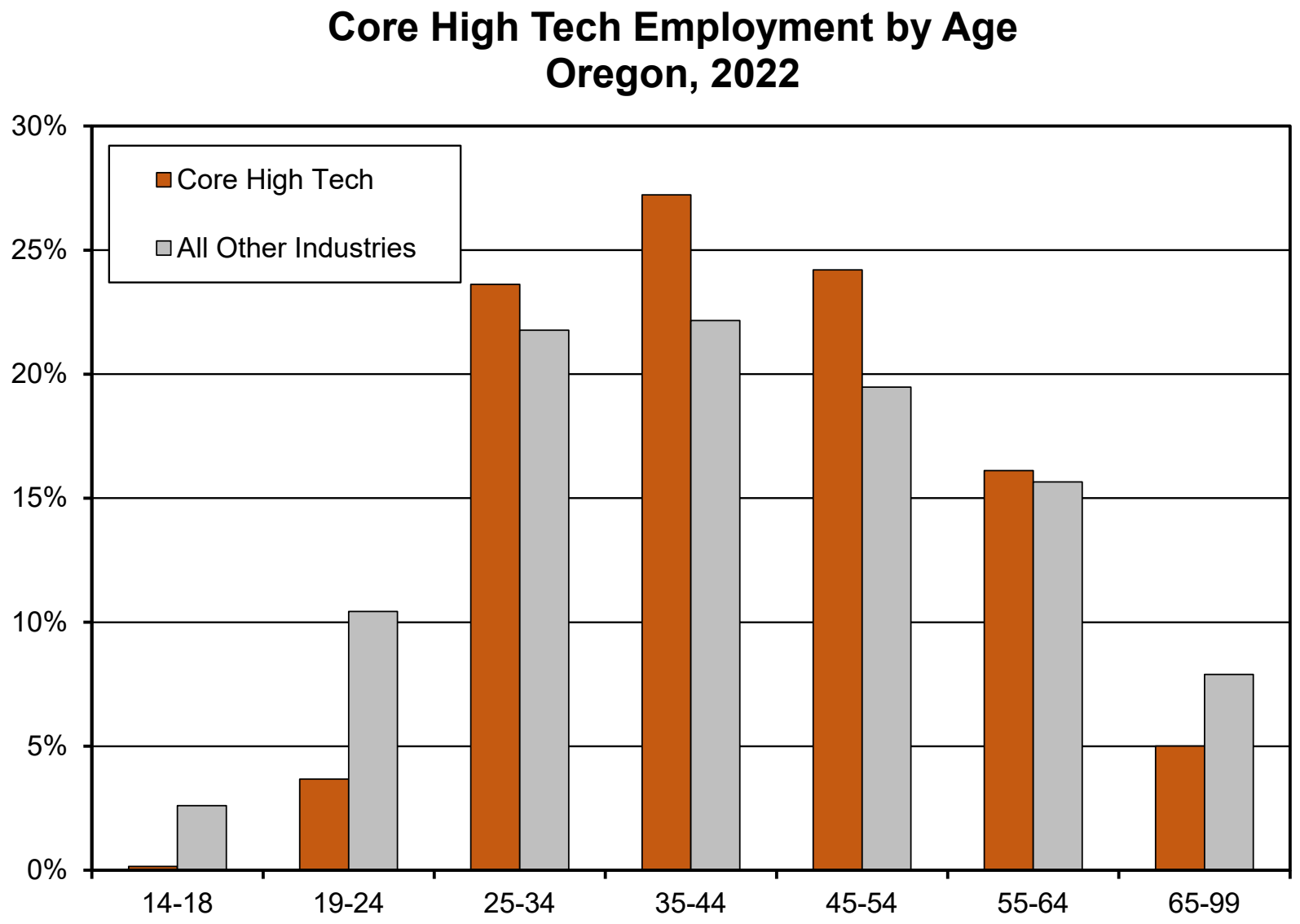
Core High Tech Industry Workforce Demographics: Age



Source: U.S. Census Bureau; Longitudinal Employer-Household Dynamics

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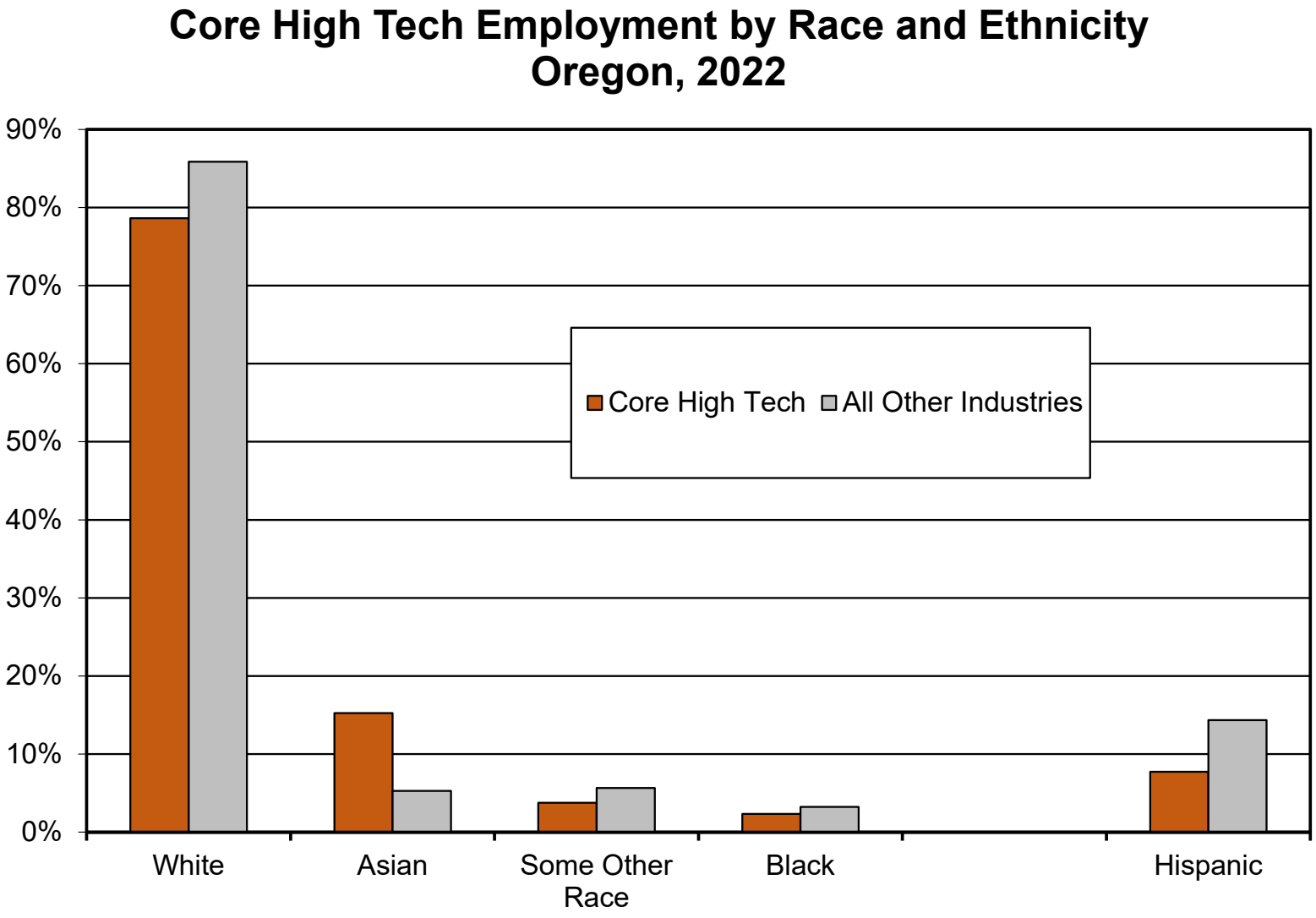
Core High Tech Industry Workforce Demographics: Race & Ethnicity



Source: U.S. Census Bureau; Longitudinal Employer-Household Dynamics

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Largest Occupations in Core High Tech

Largest Occupations in Core High Tech

Title	Employment (2021)	Wages (2022)
Software Developers and Software Quality Assurance Analysts and Testers	10,100	$56.46
Electronics Engineers, Except Computer	4,500	$48.63
Semiconductor Processing Technicians	4,300	$25.78
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	2,700	$20.68
Civil Engineers	2,600	$45.87
Architectural and Engineering Managers	2,400	$74.31
Project Management Specialists and Business Operations Specialists, All Other	2,400	
Computer User Support Specialists	2,300	$29.07
Industrial Engineers	2,300	$49.65
Computer and Information Systems Managers	2,200	$71.81
All Occupations, All Industries		*$30.14*

Source: Oregon Employment Department

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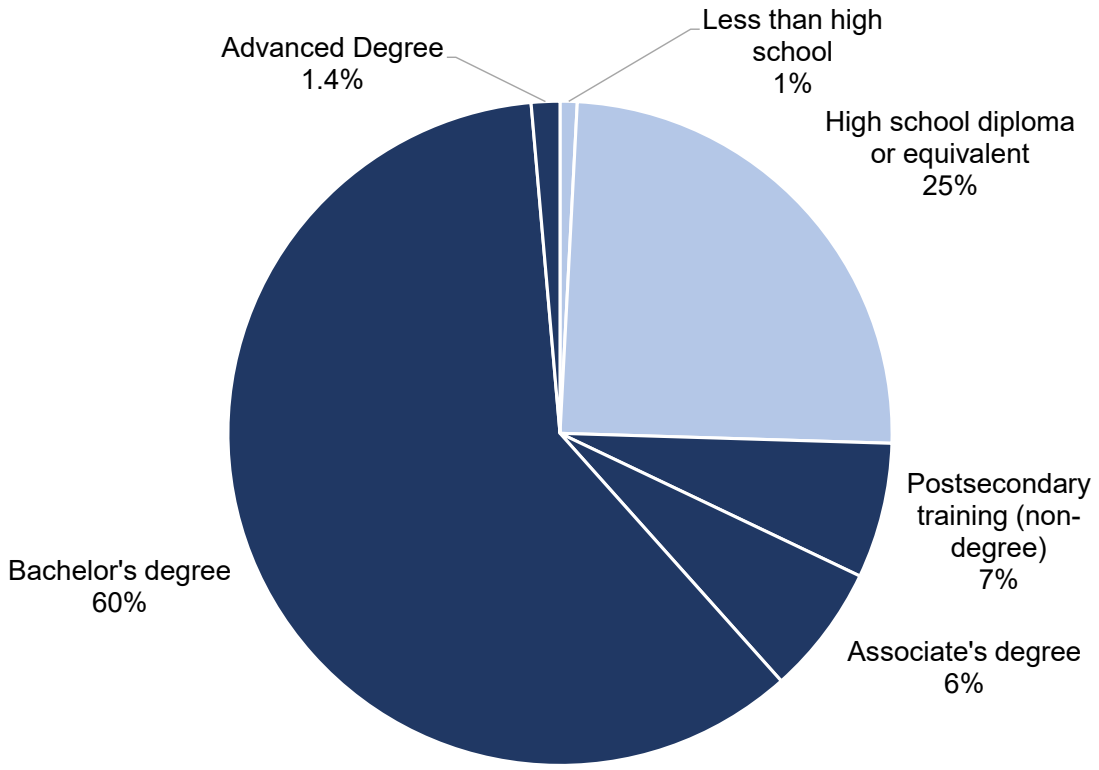
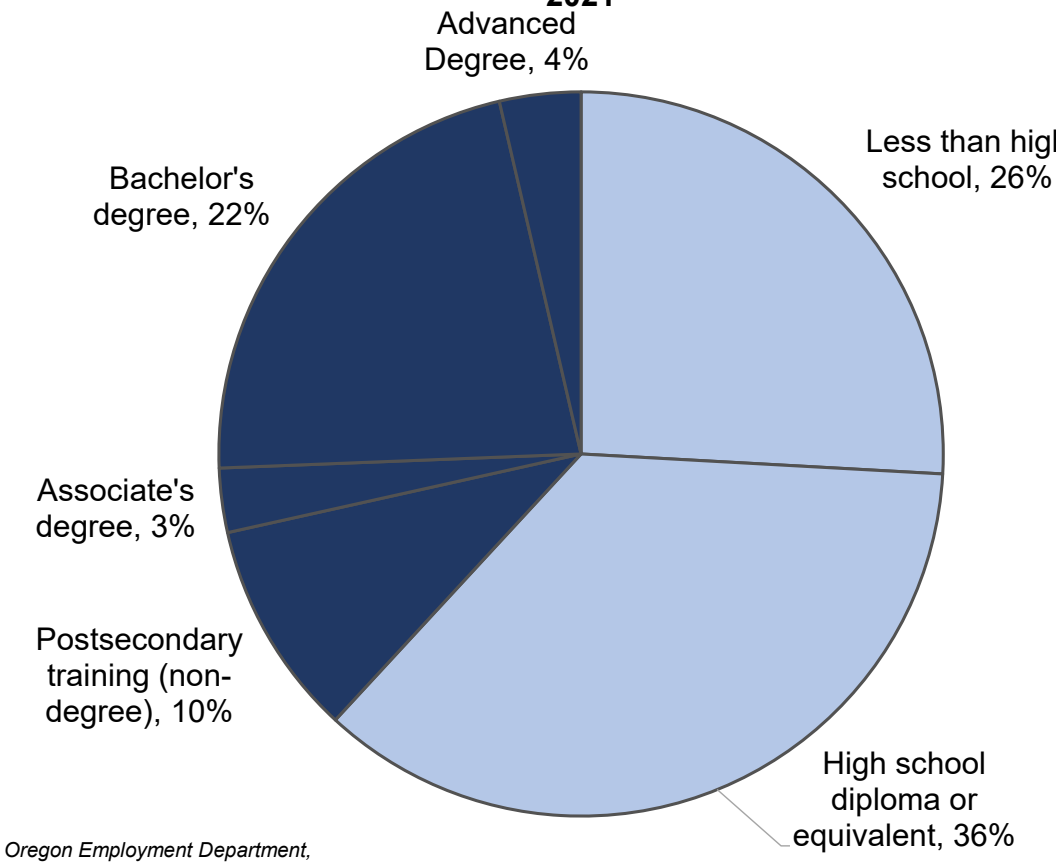
Core High Tech Jobs More Likely to Require Higher Education

Typical Entry-Level Education Requirements for Core High Tech Jobs in Oregon, 2021



Source: Oregon Employment Department, Occupational Employment Projections 2021-2031

Typical Entry-Level Education Requirements for All Jobs in Oregon, 2021



Source: Oregon Employment Department, Occupational Employment Projections 2021-2031

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Oregon's 2022 Job Vacancies: Focus on 10 Top Core High Tech Occupations

	Largest 10 Core HighTech Occupations	All Industries
Vacancies	**2,243**	**103,977**
Average Hourly Wage	$39.26	$21.66
Full-time Positions	94%	81%
Permanent Positions	97%	94%
High School	69%	29%
Requiring Previous Experience	88%	52%
Open 60+ Days	30%	33%
Difficult to Fill	68%	72%

Source: Oregon Employment Department

Job vacancies in the ten largest core high tech occupations are far more likely to require previous experience and education than vacancies across the entire economy.

They also pay higher wages than the overall average.

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Technology Industry Consortium

Survey Results

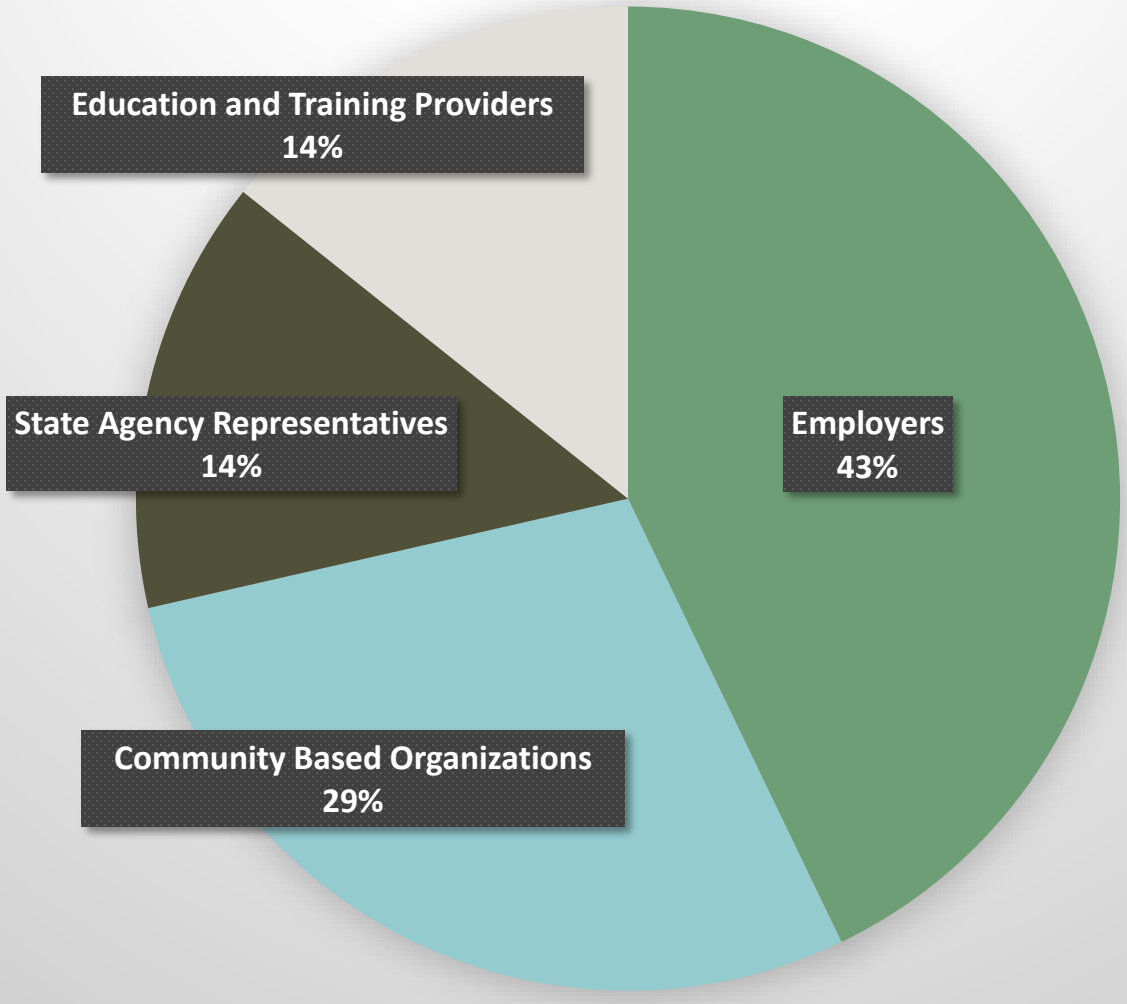
Jennifer Purcell, Director, Future Ready Oregon, Higher Education Coordinating Commission

November 14, 2023

Guiding Questions

- What are the three highest priority technology workforce development needs?
- What specific workforce development priorities or strategies has your organization identified to advance a diverse workforce?
- What are the policy barriers that impact your ability to move these priorities forward?
- What are the priorities or strategies that can be advanced with funding?

Survey Responses



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Survey Insights

What do you consider to be the three highest priority technology workforce development needs?

Career-connected, work-based learning, career awareness, exploration, and talent recruitment

- Industry partnerships to train educators, offer apprenticeships; expand career-connected learning infrastructure to address awareness gap
- Early introduction to IT careers (Middle School) and increased access to software, development tools, hackathons, etc. that spark interest; summer funding for STEM CBOs
- Attract more potential employees to Oregon, provide access to training and other services to round out their qualifications

Curriculum development and adaptation

- STEM education and curriculum adaptation that embeds technology and expands career awareness; adapt curricula to meet Oregon hiring trends and advancements in tech; develop process to keep STEM curriculum updated
- Develop employability standards and/or industry-recognized credential for K-12 and post-secondary curriculum and college prep; computer science graduation requirements
- Inform ODE CTE pathways in Computer Science and IT (cybersecurity, programming, IT systems) and Advanced Manufacturing (technical skills to run complex control systems)

Advancing diversity

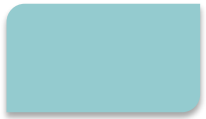
- Enabling greater diversity and participation in tech career paths
- Diversify the workforce pipeline, especially in engineering and computer science, where women are underrepresented
- Broaden the focus of diversity measures to include underrepresented populations other than gender

Other specific occupations, skills, and pathways

- Security personnel and security best practices, tools, etc.
- Upskilling related to skills gaps for semiconductor industry, both technician and higher-level engineers
- Cross-disciplinary AI curriculum for K-12, community colleges, and public universities
- PhDs to support research needs

Survey Insights

What specific workforce development priorities or strategies has your organization identified to advance a diverse workforce?



Partnerships, career awareness, outreach and recruitment

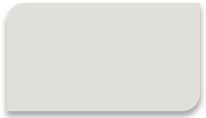
- Make STEM cool again through hands-on learning; engage in outreach activities with diverse communities; collaborate with CBOs, work with/invest in academic institutions

Data-informed identification of issues and opportunity gaps

- Oregon STEM is creating a data tool that aggregates and analyzes job market data and compares it to credential opportunities, providing a clear through-line from classroom to career; data tools can bring clarity to complex issues, uncover systemic inequities, and inform availability of career pathways and program development for priority students

Hiring practices

- Minimize bias in the hiring process through staff training, resume redaction, sharing openings to reach underrepresented populations; leveraging non-profits to enhance returnships and onramp programs; remove unnecessary qualification barriers; provide more on-the-job training and paid training programs



Education and workplace culture

- Build affinity communities, including support of affinity organizations

Low-barrier education and career pathways, scholarships and incentives

- Work with industry partners for program and career pathway advising and teacher prep; OSU is offering stackable pathways to a credential, with more short-form offerings like microcredentials, to increase accessibility; collaborate with educational institutions to create curricula that align with industry needs
- Scholarships for tuition and experiential learning; tuition benefit plans

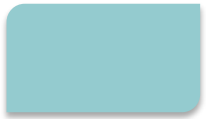
Survey Insights

What policy barriers impact your ability to move these priorities forward?

- Expand SB3 Future Planning to include statewide adoption of a career-connected learning platform for students starting in middle school to include an AI career coach who can plan clear academic pathways and shift as the job market shifts
    - Currently SB3 includes resume writing, interview skills, and financial planning for high school juniors and seniors
    - Example – other states like Utah systematically elevate career readiness
- Computer science and artificial intelligence are not identified in statewide K-12 graduation requirements
- Insufficient state investment in higher education
    - Examples – Ohio, Florida, Texas
- Short-form credit offerings aren't eligible for Pell grants; less accessible for employees whose tuition isn't covered by an employer

Survey Insights

What priorities or strategies can be advanced with funding?



CTE career pathways development

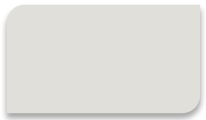
- State CTE plan update; CTE career pathways, K-12 computer science implementation; post-secondary prep programs

Curriculum development

- Develop curriculum in computer science, artificial intelligence, and STEM that includes hands-on learning

Teacher prep

- Train educators in computer science, artificial intelligence, and STEM



Internships and earn-and-learn opportunities

- Incentives for small businesses to train interns and offer apprenticeships; rethink minimum qualifications; engage on-the-job training programs

Credit for Prior Learning (CPL)

- Expand CPL policies at all Oregon institutions of higher education to provide more seamless and affordable pathways for adult learners to advance their education and careers

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