MANUFACTURING SKILL STANDARDS COUNCIL

ACT® Workforce Solutions

Charging Forward: Navigating the New EV Frontline Workforce Landscape
E4C – March 2, 2024

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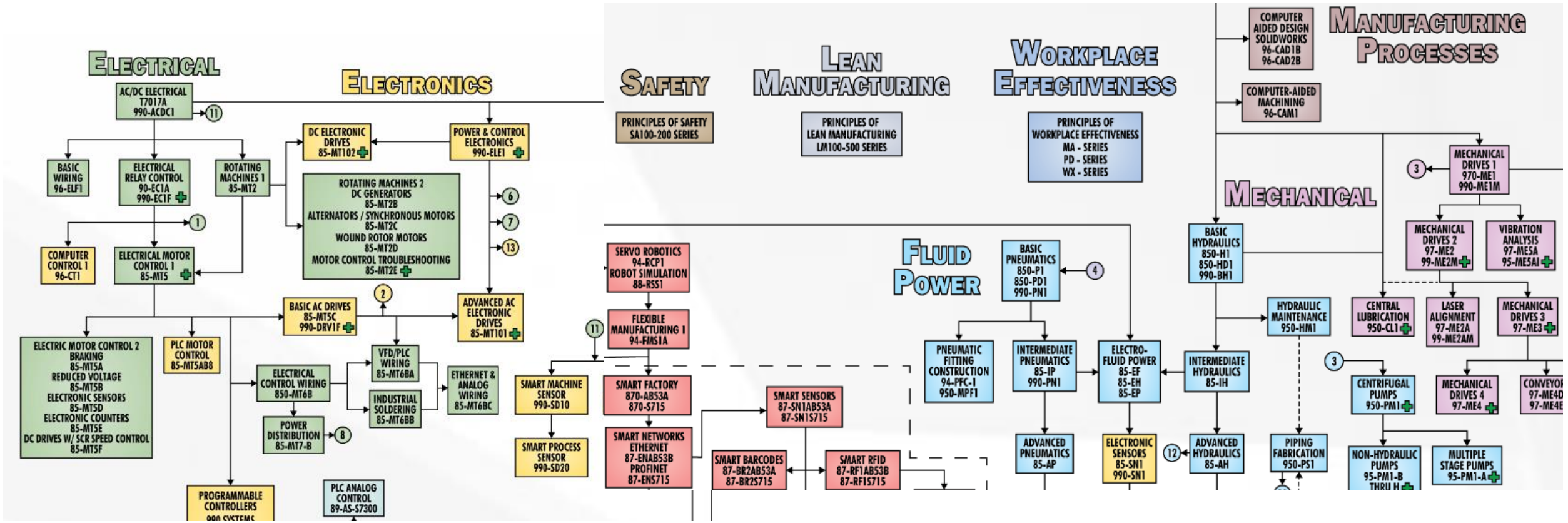
Christine Nieto, ACT Workforce Solutions

Today's Agenda

- The Demand for Careers in EV and Advanced Manufacturing
- Training and Certification Programs (Entry/Advancement)
- Models of Success
- Exploring Careers aligned to EV Manufacturing Certifications

WORD CLOUD/ICE BREAKER

EV Manufacturing Program

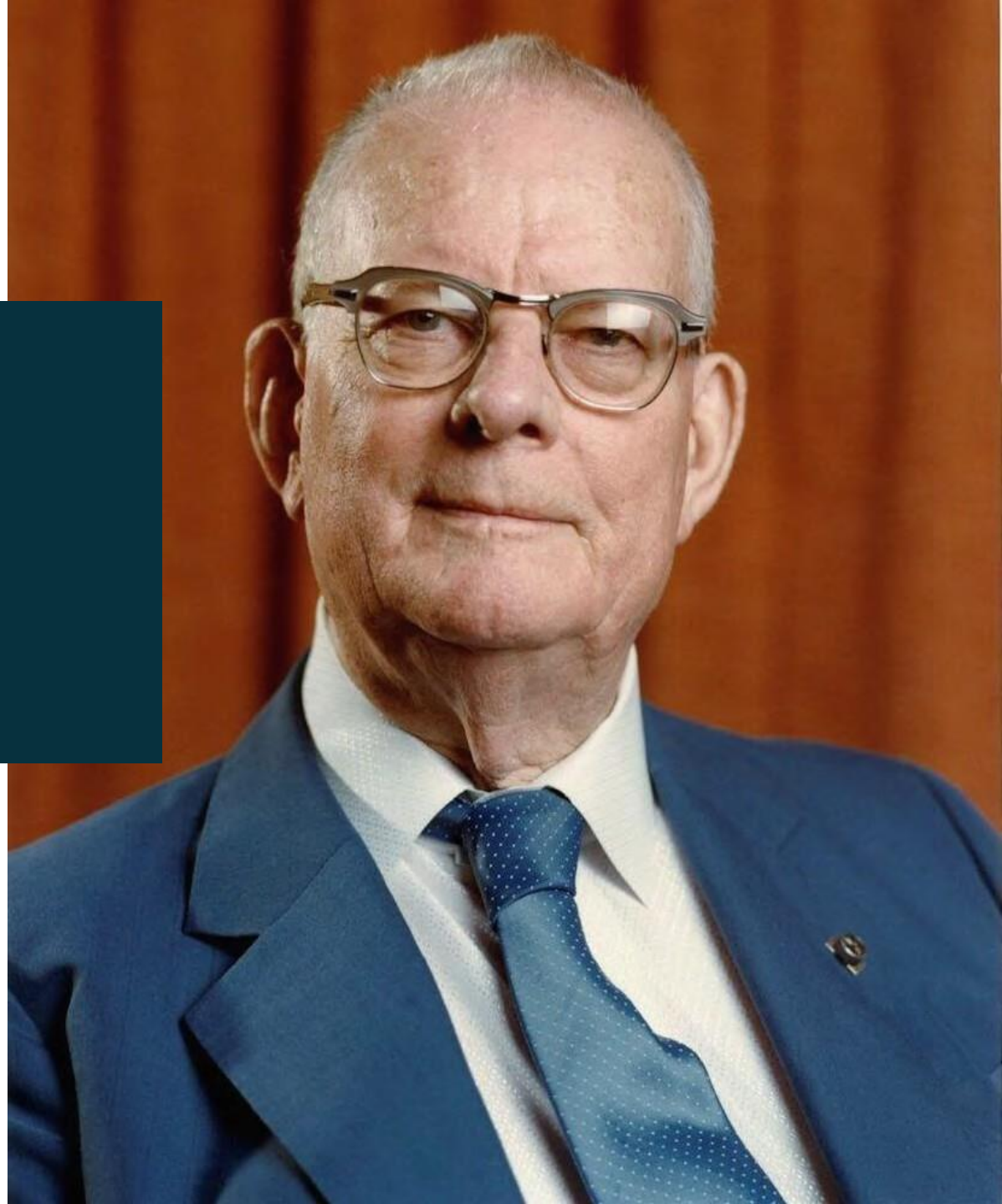


Uncovering the Demand for Manufacturing & EV Careers

Words of Wisdom

"IN GOD WE TRUST…ALL OTHERS MUST BRING DATA."

W. EDWARDS DEMING



The supply chain drives nearly 1/3 of California's economy & supports 1 in 5 jobs

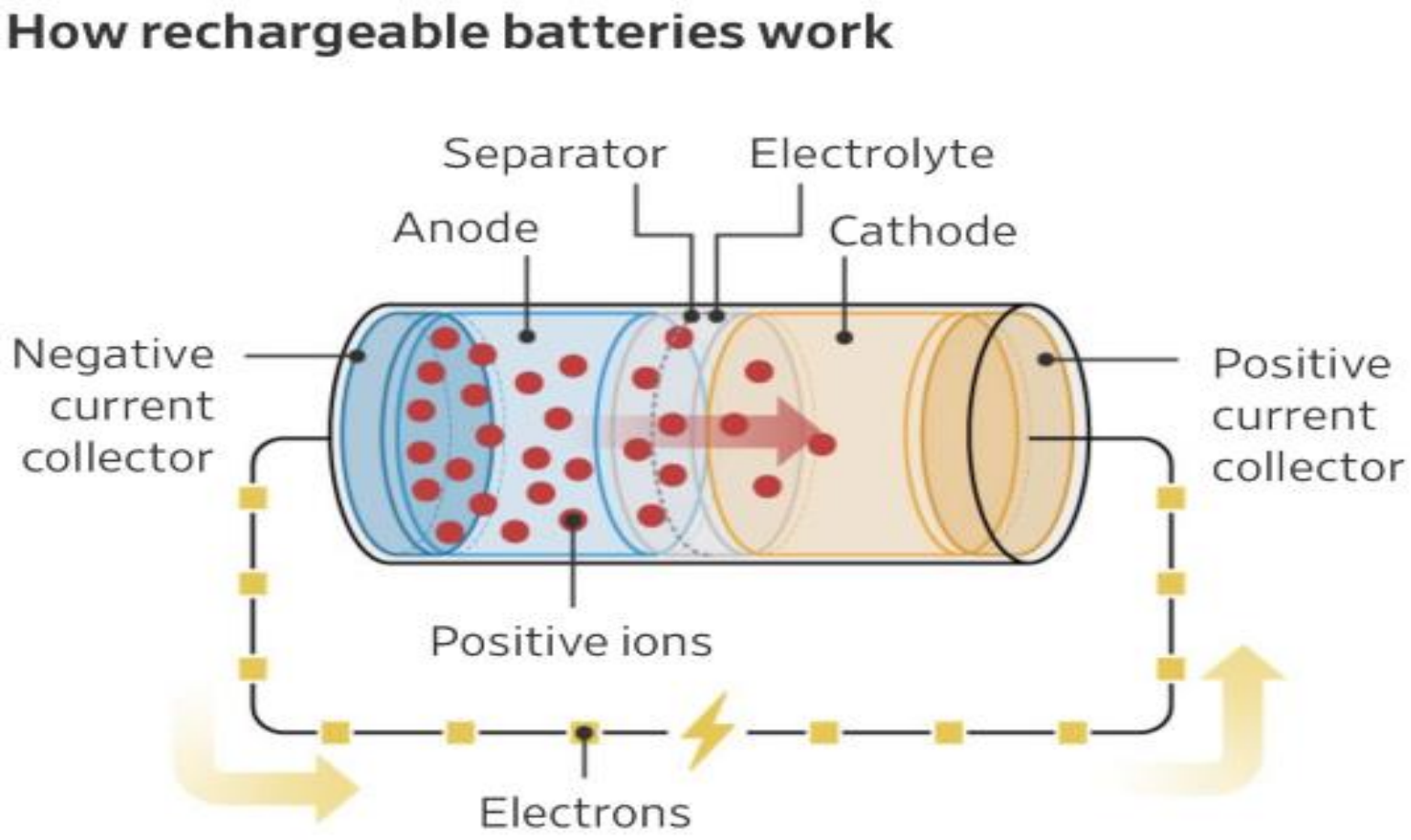
Apple suppliers' global locations and the number of fabs per country

75	United States	148	Japan
9	Mexico and Latin America	38	South Korea
5	Israel	35	Taiwan
9	United Kingdom	26	Malaysia
6	Belgium & Netherlands	23	Philippines
13	Germany & Austria	19	Thailand
6	Czech Republic & Hungary	18	Singapore
7	France & Italy	10	Vietnam
330	China		

Apple's 776 Global suppliers

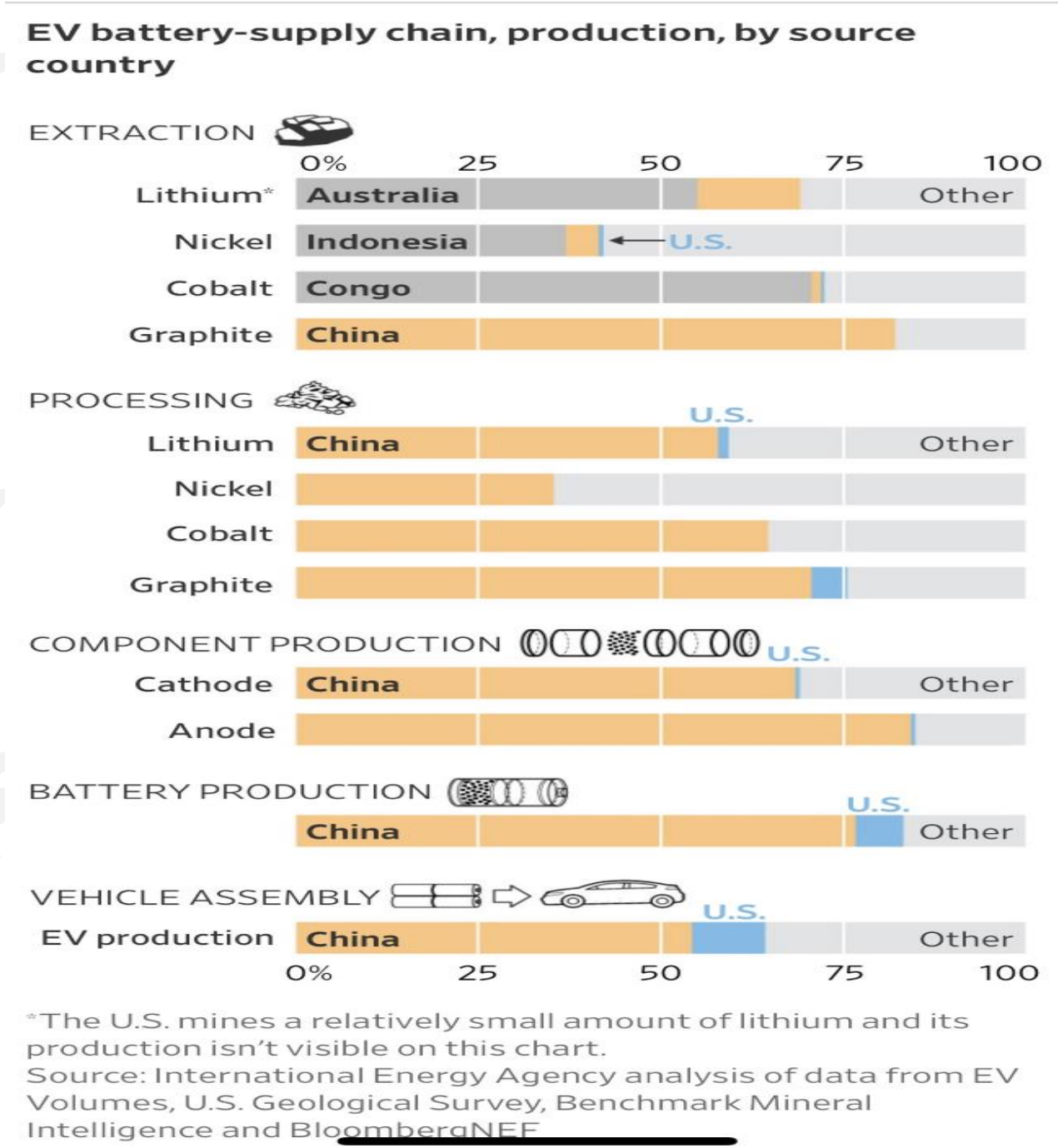
EV Lithium Battery Components & Functions

To understand the intricacies of battery manufacturing, let's review the basics of a battery's components and how they work.



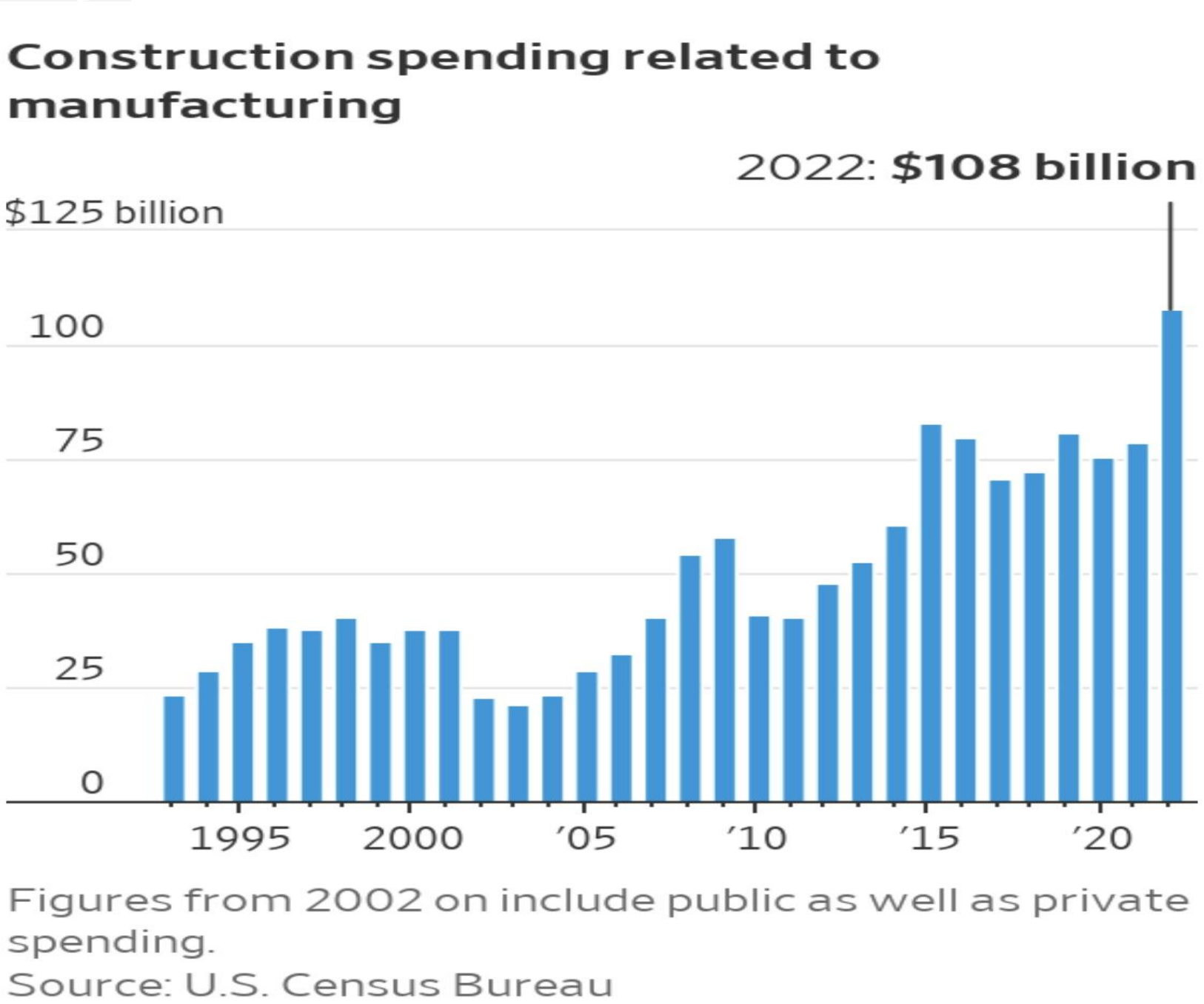
EV Battery Supply Chain

- Mining
- Processing
- Production
- Assembly



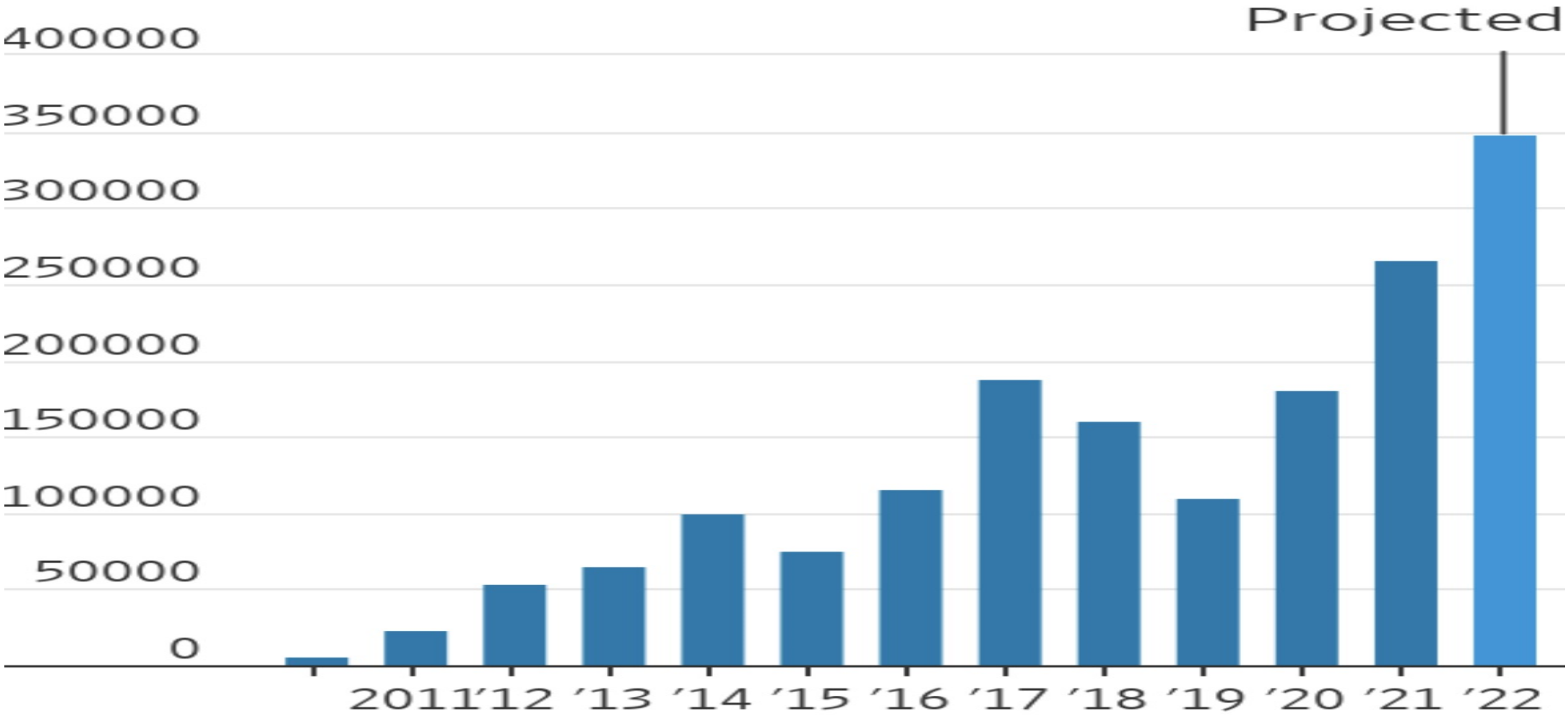
Made in America is Making a Comeback

- 800,000 New Jobs Created 2021-22
- Investment Has Created Demand for 800,000+ More Jobs



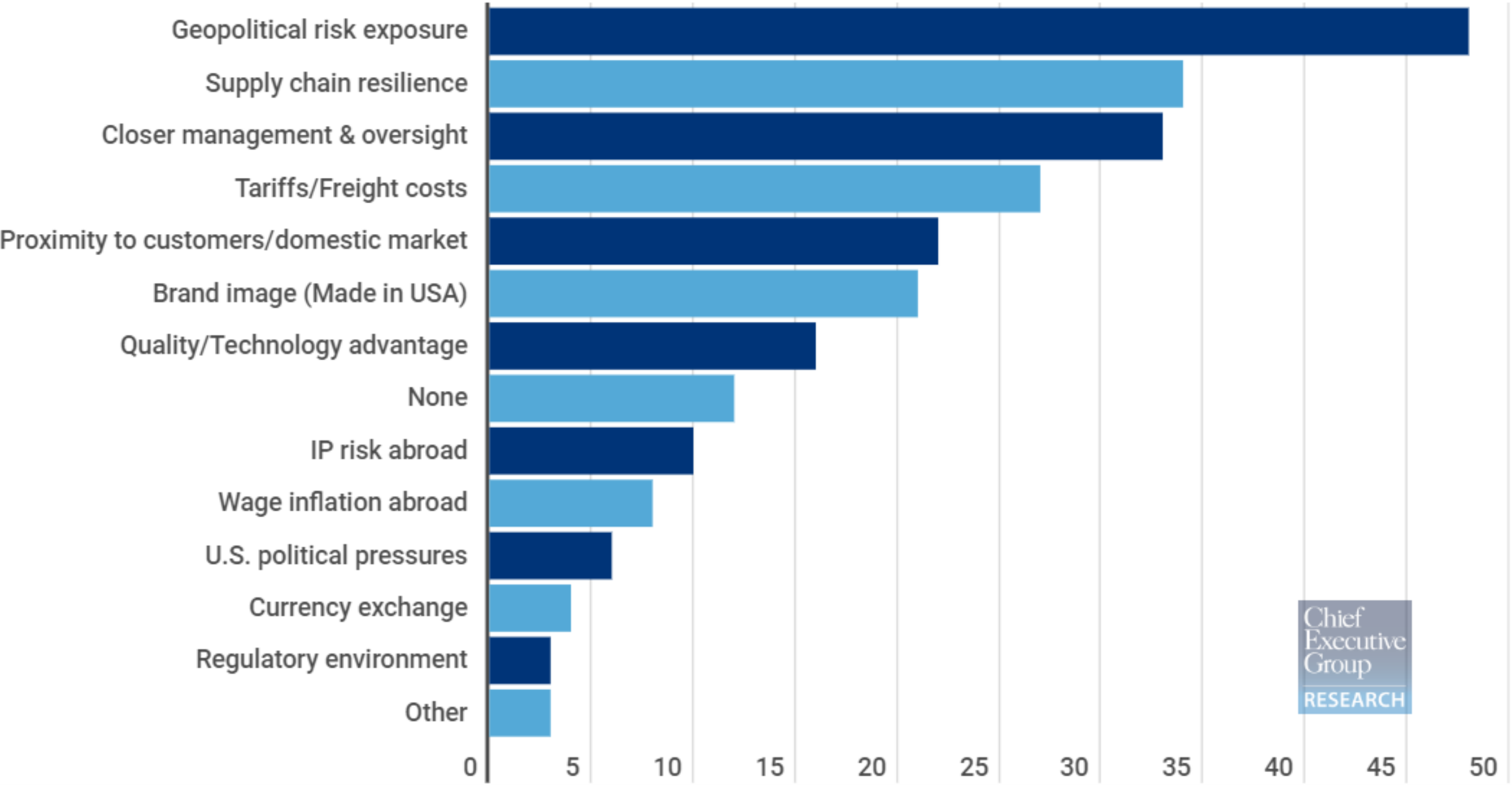
Reshoring

Number of job announcements per year

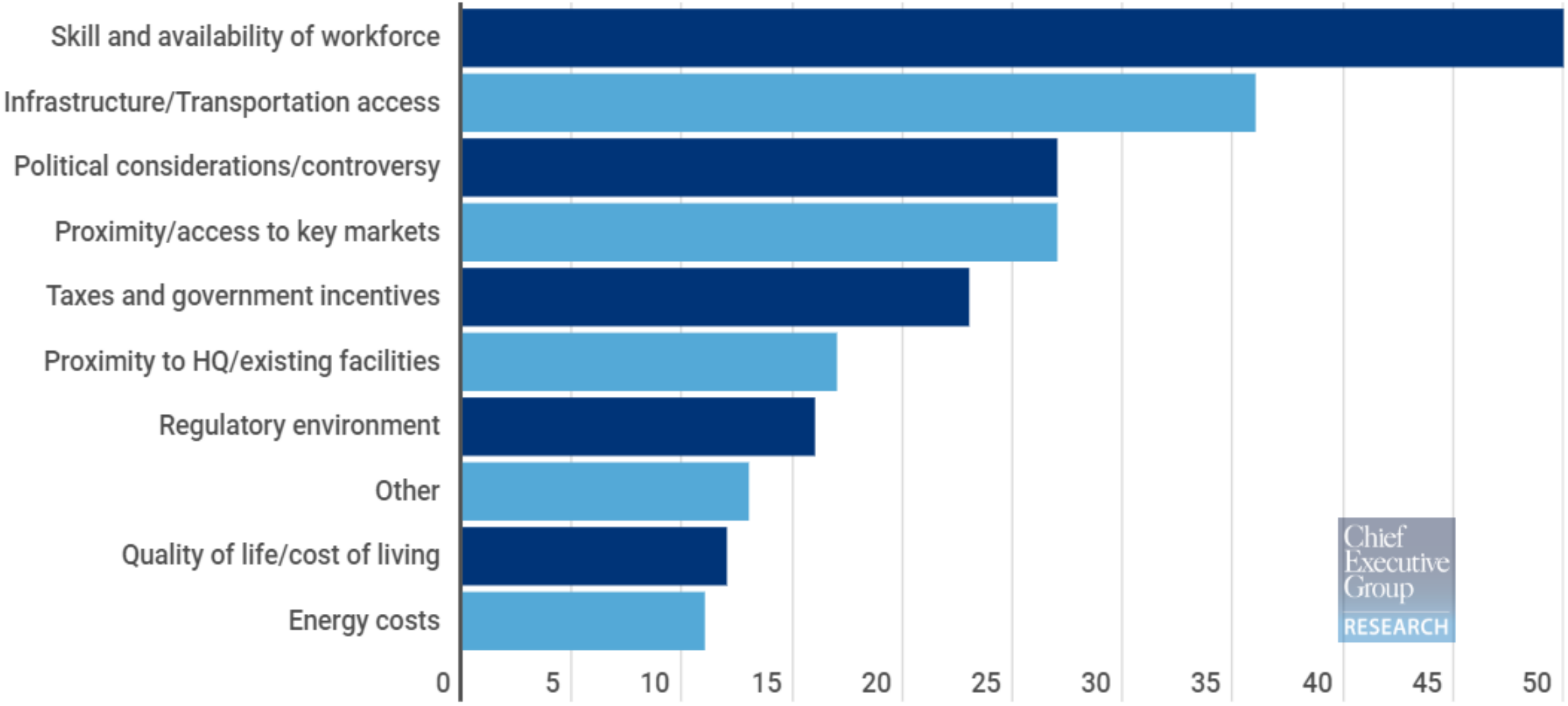


Source: Reshoring Initiative

What do you see as the main drivers for reshoring operations? (Select only the top 3)



What is most important to you when looking for a reshoring location for your operations in the U.S./North America? (Select only the top 3)



Respondents were asked to select up to three options.

CA Manufacturing Sector SUPERPOWERS & DEI Impact

MFG COMPANIES

30K

MFG EMPLOYEES

1.3M

MULTIPLIER IMPACT

2.5X

# of jobs created for every one mfg job

MFG WAGES

$87K

annual average

MFG GSP

$316B

11% of CA of total output

Small Manufacturing is BIG

64%

of manufacturers have less than 25 employees

Manufacturing Equals Opportunity

By 2025, **1.9 million** jobs will require some type of middle skill training

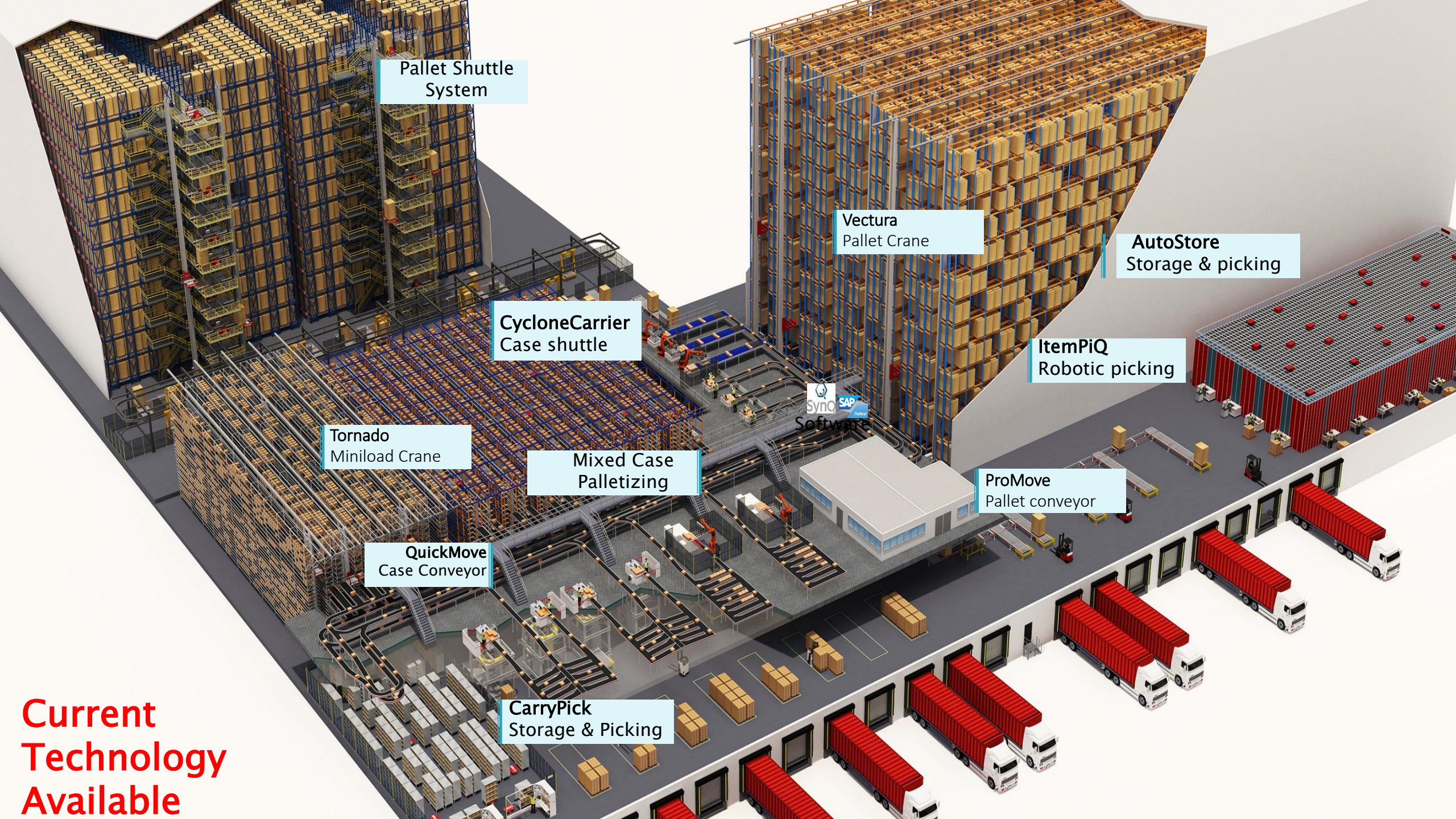
Manufacturing is Diverse

34%

of workers are minority

31%

of workers are women

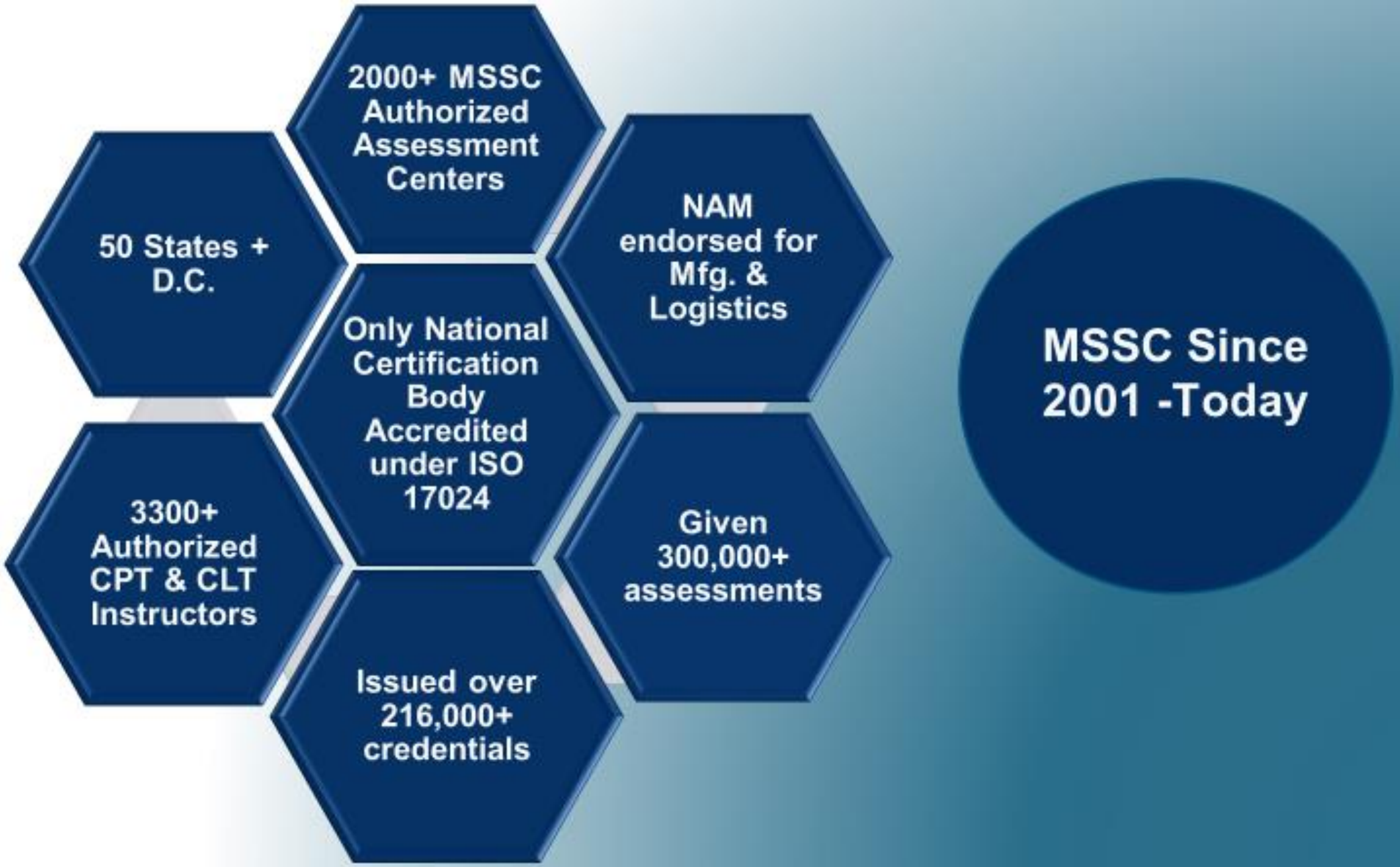


Current Technology Available

Connecting Students to Success in Education and Career through Certifications

CPT 4.0

Video: MSSC 25 Years


2000+ MSSC Authorized Assessment Centers
50 States + D.C.
NAM endorsed for Mfg. & Logistics
Only National Certification Body Accredited under ISO 17024
3300+ Authorized CPT & CLT Instructors
Given 300,000+ assessments
Issued over 216,000+ credentials
MSSC Since 2001 -Today

MSSC Certifications

Advanced Manufacturing, Logistics, Supply Chain Automation

Certified Production Technician 4.0 & Hands-on + Certification

- Safety+
- Quality Assurance and Measurement+
- Manufacturing Process & Production+
- Maintenance Awareness+

Certified Logistics Technician 4.0

- Certified Logistics Associate

Certified Forklift Technician

Certified Technician - Supply Chain Automation

Equipment Maintenance

Equipment Repair

Network Repair

Aligned to Industry 4.0 Evolving Technologies

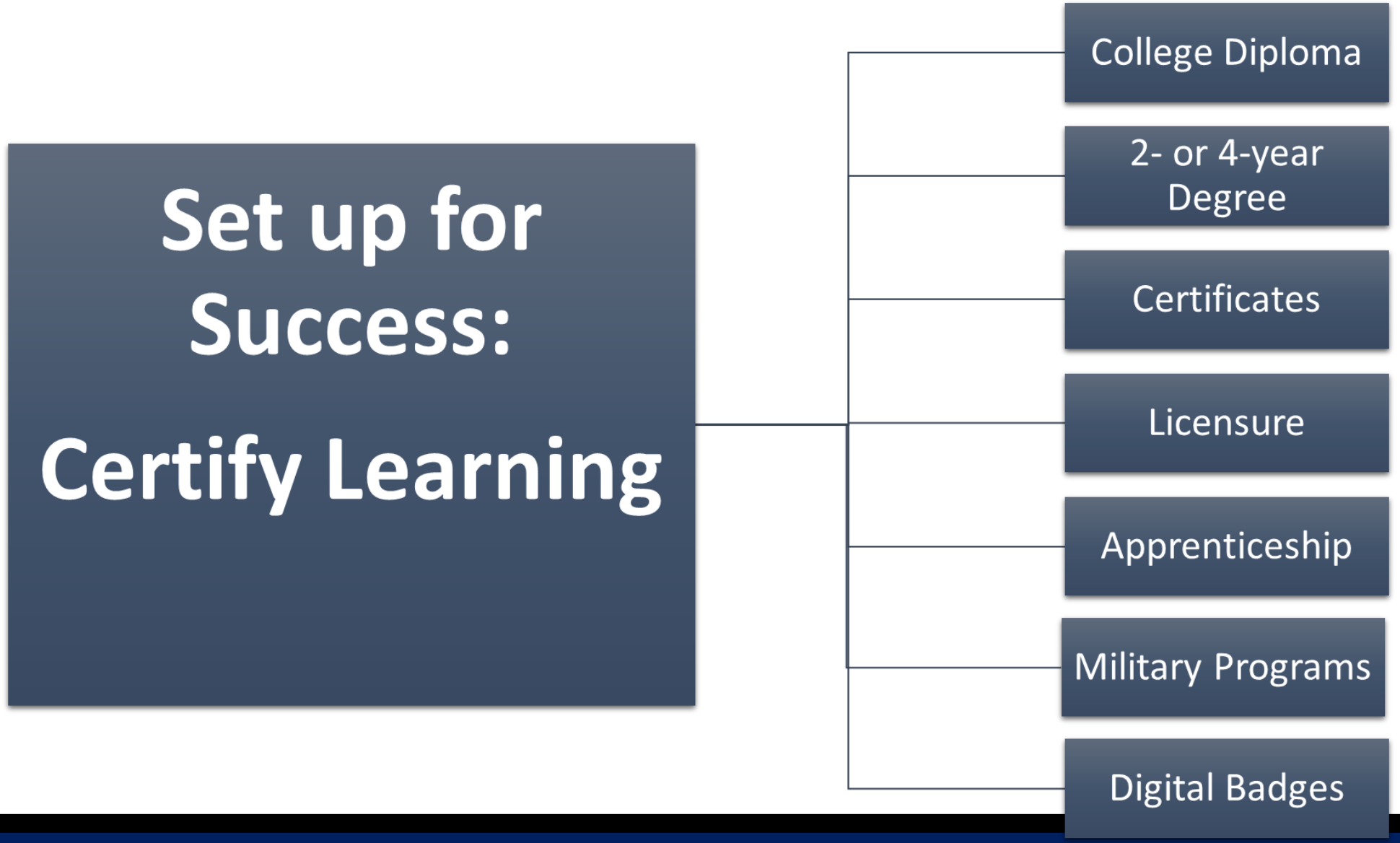
Artificial Intelligence (AI) MSSC has embedded "Industry 4.0" Technologies:

- 5G
- Industrial Internet of Things (IIOT)
- Additive (3D) Manufacturing
- Autonomous Robots
- Augmented Reality
- Data Analytics
- Nanomanufacturing
- Advanced Materials

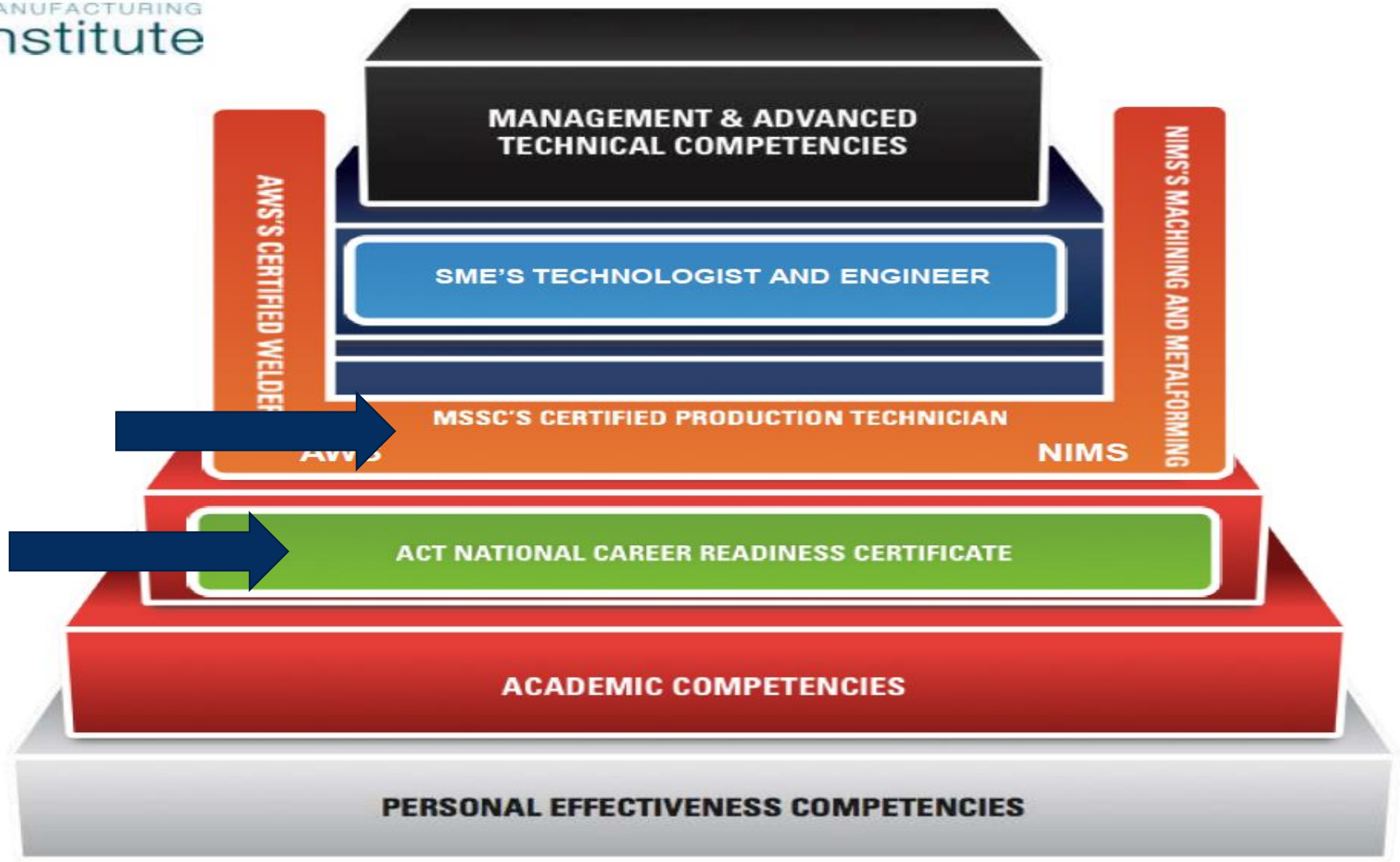
ISO Certification Process

Training and Certification Programs in Advanced Manufacturing

Stackable Certifications



Manufacturing Institute Framework for Stackable Credentials



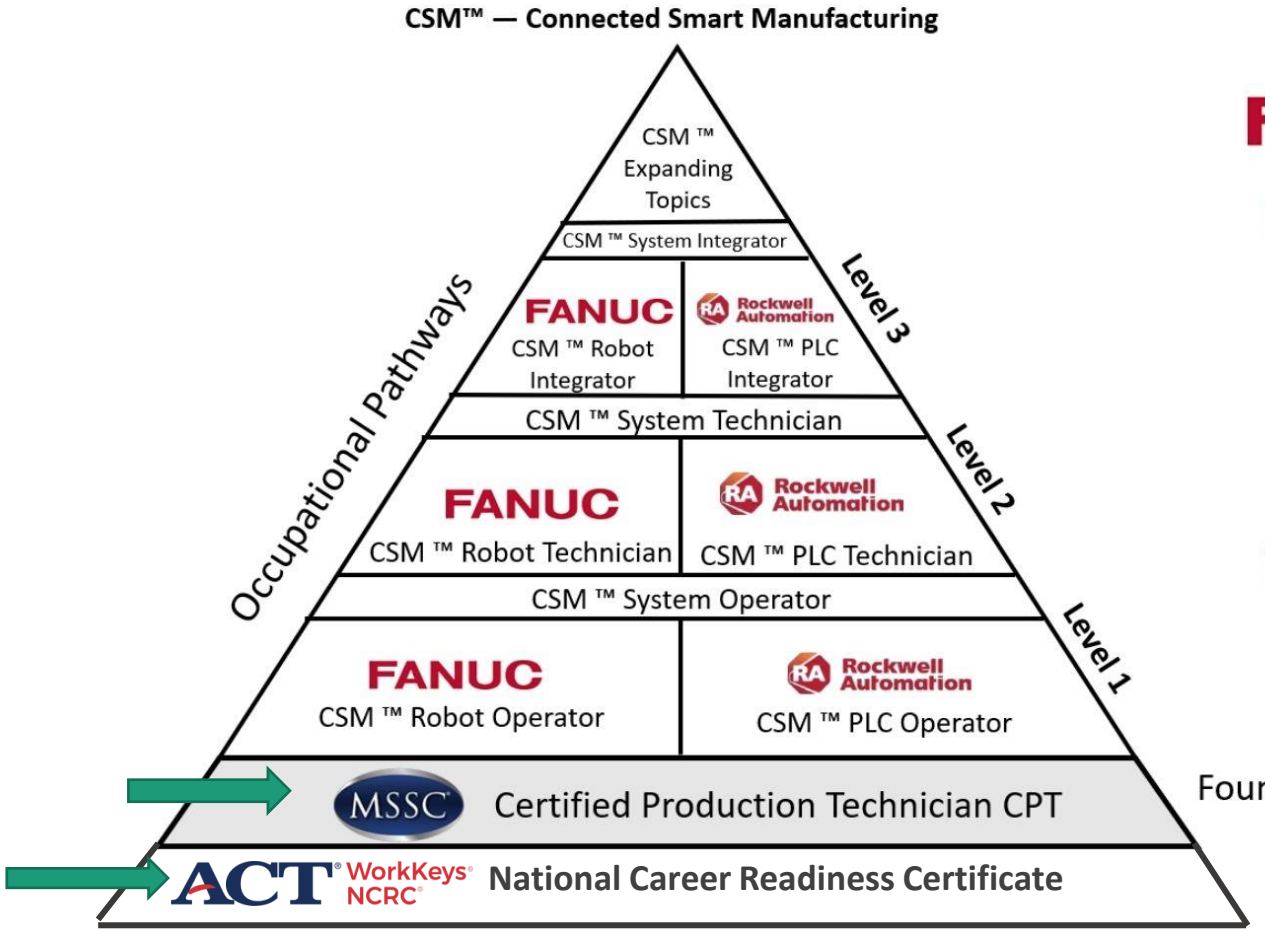
Robotics Industry Certification Pathway

FANUC

Employability / Soft Skills:

- Discrete Technology
- Integrated Technology
- Accountability
- Communication
- Time Management
- Inductive Reasoning
- Problem Solving
- Troubleshooting
- Company Culture
- Teamwork
- Adaptability
- Safety
- Many more...

Rockwell & MSSC



FANUC

Rockwell Automation

MSSC

Nocti Business Solutions
Your Corporate Assessment Provider

ACT WorkKeys NCRC

College & Career Readiness

ACT®

Demonstrates you are college ready

ACT® WorkKeys® NCRC®

Demonstrates you are career ready

ACT®

ACT National Career Readiness Certificate: WorkKeys Assessments

Graphic Literacy

Builds the ability to find, analyze and apply information presented in workplace graphics (Charts, diagrams, floorplans, etc.)

Graphic literacy is an important part of the WorkKeys test, as countless workplace positions require employees to be able to read graphs and graphics successfully.

Workplace Documents

Measures the skills people use when they read and use written text such as memos, letters, directions, signs, notices, bulletins, policies, and regulations on the job

With the Workplace Documents Assessment, employers can find out if you have the skills needed to read with understanding real workplace documents, and, in turn, how you use this information to make job-related decisions and solve problems.

Applied Math

Builds ability to apply mathematic principles, which measures critical thinking and problem solving techniques for situations that actually occur in today's workplace

The ACT WorkKeys applied math test assesses numerical reasoning and problem-solving techniques required in the workplace. The questions are based on real-life scenarios that employees experience daily.

ACT® WorkKeys®

How to Obtain the ACT NCRC?

In under 3-hours, students can earn the ACT NCRC

Students may take one test at a time, or individually over a period time

WORKKEYS ASSESSMENTS:

1. **Applied Math -55 min**
2. **Graphic Literacy – 55 min**
3. **Workplace Documents -55 min**

Available in English & Spanish

Available web-based or paper/pencil

ACT National Career Readiness Certificate (NCRC)

Nationally recognized, portable, evidence-based credential demonstrating the essential problem-solving and critical thinking skills needed for workplace success.

Score Level - 3

Score Level - 4

Score Level - 5

Score Level - 6/7

- Awarded at Four Levels | indicating abilities to transition into post-secondary training
- Certifies Career Ready Skills
- Relevant to ALL industries/ALL occupations
- No special instructors are needed. Easily embedded as outcome in any CTE program
- 6+ Million Certificates have been awarded
- 28,000 Employers recognize this award

ACT

Align Skills with CTE Pathways

	Bronze	Silver	Gold	Platinum
Minimum Level Score on all 3 assessments	**Bronze (Score 3)**	**Silver (Score 4)**	**Gold (Score 5)**	**Platinum (Score 6)**
% of Occupations	**20%**	**71%**	**93%**	**98%**
Sample Occupations	• Auto Body Technician • Welder • Industrial Truck & Tractor Operators • Pharmacy Aide • Food Preparation	• Solar Technician • Robotics Technician • CNC tool operator • CPT/CLT • Machinist • Logistics Manager	• Semi-Conductor Processor • Computer Programmers • Web Developer • CNC tool programmer	• Robotics Engineer • Physician Assistant • Product Safety Engineers

Source: http://jobprofiles.act.org/

Item Review: Applied Math

Applied Math – Level 4

Level Four - Applied Math

Over the last 5 days, you made the following numbers of sales calls: 8, 7, 9, 5, and 7.

2. **On the average, how many calls did you make each day?**

A. ○ 5.8

B. ○ 7.0

C. ○ 7.2

D. ○ 9.0

E. ○ 36.0

Problem solving requires multiple mathematical operations; could include decimals, fractions, proportions, etc.

Workplace Documents - Level 4

Level 4 Workplace Documents

INSTRUCTIONS TO SORTING DEPARTMENT:

SPECIAL PROJECT TO FIX ORDER #888

Five long, blue plastic bins have been placed over by the overhead door. Piled on the other side of this room, near the time clock, are several thousand steel rods of varying lengths. All of those rods must be sorted by length and placed in the bins.

Bin "1" is for rods that are four to five meters long.

Bin "2" is for rods that have a length of over five meters, up to six meters.

Bin "3" is for rods that have a length of over six meters, up to eight meters.

Bin "4" is for rods that have a length of over eight meters, up to ten meters.

Bin "5" is for warped or unsmoothed rods. These will not be accepted.

2. **According to the instructions shown, what is a condition for project success other than delivery on time?**

A. ○ All rods must be sorted by both length and diameter.

B. ○ Rods eleven meters long must be leaned against the overhead door.

C. ○ The customer does not want rods that are warped.

D. ○ The five-meter-long rods must go in Bin 2.

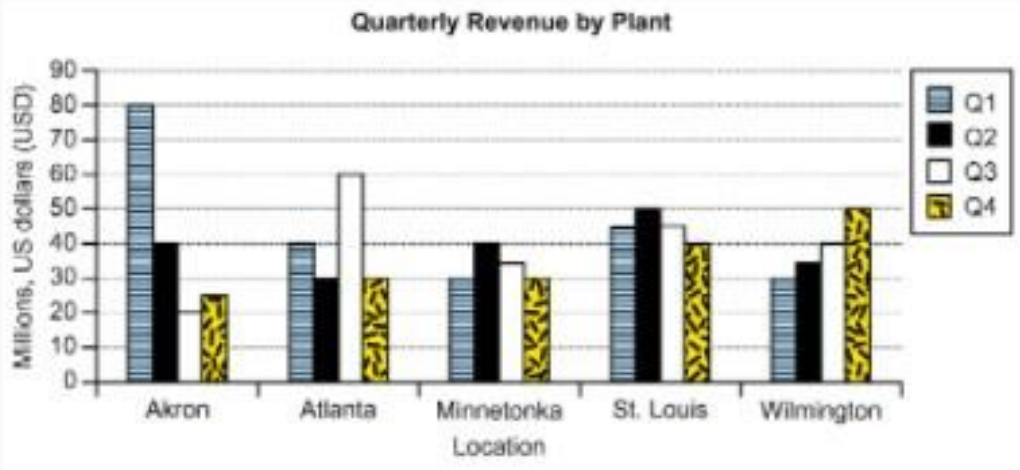
E. ○ The ten-meter-long rods must arrive at the customer in Bin 4.

[Sample Items: Workkeys.org]

Graphic Literacy - Level 4

A financial analyst reviews one year's quarterly revenue numbers to plan for future business expansions.

Level 4 Graphic Literacy



2. **The company would like to reallocate funds for plant improvement by selecting the location that had the most quarters under 40 million dollars in revenue. Which location should receive the improvement funds?**

A. ○ Akron

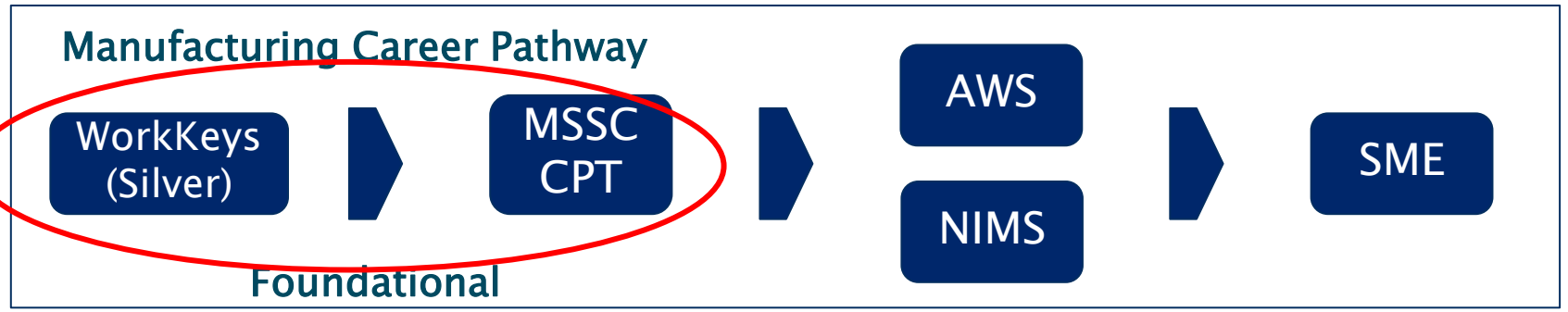
B. ○ Atlanta

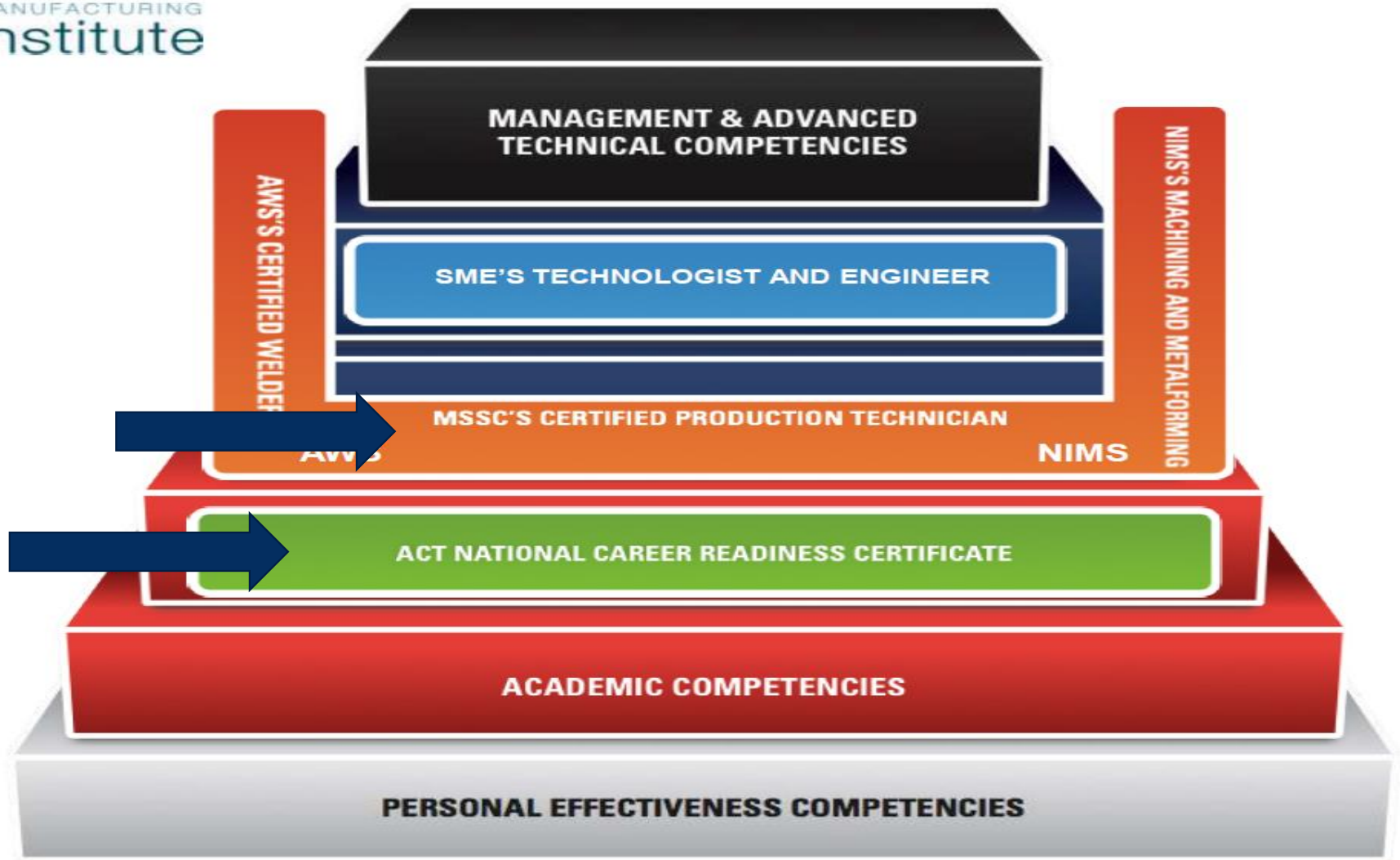
C. ○ Minnetonka

D. ○ St. Louis

ACT National Career Readiness Certificate Research:

- **Increase student performance** for successful training and completion for MSSC CPT
- Higher **job placement** and retention rates
- A **data driven strategic advantage** to improve outcomes
- **Stackable certificates b**etter prepare students for in-demand jobs




MANAGEMENT & ADVANCED TECHNICAL COMPETENCIES
SME'S TECHNOLOGIST AND ENGINEER
AWS'S CERTIFIED WELDER
NIMS'S MACHINING AND METALFORMING
MSSC'S CERTIFIED PRODUCTION TECHNICIAN
NIMS
ACT NATIONAL CAREER READINESS CERTIFICATE
ACADEMIC COMPETENCIES
PERSONAL EFFECTIVENESS COMPETENCIES

The MSSC CPT Credential

- CPT is a nationally portable, industry-led program that prepares and certifies individuals for career pathways in advanced manufacturing.

- This training program delivers the 21st Century, in-demand skills that today's employers need for over 6 million frontline production jobs

- Each CPT Course is approximately 45-55 hours and has been rated by the National College Credit Recommendation Service (NCCRS) at three credits each

Certified Production Technician (CPT) 4.0: 4 Certificates and full Certification

- 4 Critical Work Modules:
  - Safety
  - Quality Practices & Measurement
  - Manufacturing Processes & Production
  - Maintenance Awareness
  - Green Production (optional)

CPT Overview (Video)

CPT Module 1: Safety & Employability
45-55 hours

Safety & Employability

- Production Teams
- Training and Leadership
- Safety Organization
- Personal Protective Equipment
- Fire and Electrical Safety
- Work Area Safety
- Hazardous Material Safety
- Tool and Machine Safety
- Material Handling Safety

CPT Module 2: Quality Practices and Measurement
45-55 hours

Quality Practices and Measurement

- Multi-view Drawings
- Assembly Drawings and Fasteners
- Geometric Dimensioning and Tolerancing
- Basic Measurement
- Precision Measurement Tools
- Dimensional Gauging
- Quality Systems
- Introduction to SPC
- Control Charts
- Continuous Improvement

CPT Module 3 : Manufacturing Processes and Production | 45-55 hours

Manufacturing Process & Production

- Mechanical Principles
- Mechanical Linkages
- Gear Drives
- Machining Processes
- Machine Tooling
- Machine Operations
- Equipment Procedures
- Production Planning and Workflow
- Production Control

CPT Module 4 : Maintenance Awareness
45-55 hours

Maintenance Awareness

- Welding
- Basic Electrical Circuits
- Electrical Measurements & Power
- Pneumatic Power Systems
- Basic Pneumatic Circuits
- Principles of Pressure and Flow
- Lubrication Concepts
- Bearings and Couplings
- Belt & Chain Drives
- Machine Control Concepts, Automation, & Operation Modes
- Electrical Motor Control

Nationally Recognized Certification (MSSC-CPT)

MANUFACTURING SKILL STANDARDS COUNCIL

HAS CONFERRED UPON

GREGORY BARKLEY

THE CERTIFIED PRODUCTION TECHNICIAN$_{AE}$ CERTIFICATION

For the successful completion of all four CPT production technician assessments in the areas of SAFETY, QUALITY PRACTICE & MEASUREMENT, MANUFACTURING PROCESSES AND PRODUCTION, MAINTENANCE AWARENESS.

GIVEN ON THIS 10TH DAY OF MARCH IN THE YEAR 2016

CPT AE

Skills Certification System

Certification can be verified at verify.msscusa.org

CHIEF EXECUTIVE OFFICER
Candidate ID: A46861
Expiration Date: 3/10/2021
Certification Date: 3/10/2016

CPT

MSSC

CERTIFIED PRODUCTION TECHNICIAN

CRITICAL PRODUCTION FUNCTIONS COVERED BY MSSC COURSES AND ASSESSMENTS:

The Manufacturing Skill Standards Council (MSSC) credentialing system leading to a CPT covers the four critical production functions, as defined by MSSC's industry-led, nationally validated skills standards, common to all sectors of manufacturing: Safety, Quality & Continuous Improvement, Manufacturing Processes & Production, and Maintenance Awareness. Each area is addressed with a separate assessment. MSSC training and assessments are organized around those four modules. An individual can earn a "Certificate" if they pass one or more assessments. However, they must pass all four assessments to earn the full "CPT" certification. MSSC strongly recommends that individuals be at the 9th grade level of math and 10th grade level of English before attempting MSSC courses and assessments. The four critical functions and their related key activities are described below:

SAFETY

1. Work in a Safe and Productive Manufacturing Workplace
2. Perform safety and environmental inspections
3. Perform emergency drills and participate in emergency teams
4. Identify unsafe conditions and take corrective action
5. Provide safety orientation for all employees
6. Train personnel to use equipment safely
7. Suggest processes and procedures that support safety of work environment
8. Fulfill safety and health requirements for maintenance, installation, and repair
9. Monitor safe equipment and operator performance
10. Utilize effective, safety-enhancing workplace practices

QUALITY PRACTICES & MEASUREMENT

1. Participate in periodic internal quality audit activities
2. Check calibration of gages and other data collection equipment
3. Suggest continuous improvements
4. Inspect materials and product/process at all stages to ensure they meet specifications
5. Document the results of quality tests
6. Communicate quality problems.
7. Take corrective actions to restore or maintain quality
8. Record process outcomes and trends
9. Identify fundamentals of blueprint reading
10. Use common measurement systems and precision measurement tools

MANUFACTURING PROCESSES & PRODUCTION

1. Identify customer needs
2. Determine resources available for the production process
3. Set up equipment for the production process
4. Set team production goals
5. Make job assignments
6. Coordinate work flow with team members and other work groups
7. Communicate production and material requirements and product specifications
8. Perform and monitor the process to make the product
9. Document product and process compliance with customer requirements
10. Prepare final product for shipping or distribution

MAINTENANCE AWARENESS

1. Perform preventive maintenance and routine repair
2. Monitor indicators to ensure correct operations
3. Perform all housekeeping to maintain production schedule
4. Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with:
   - Electrical systems
   - Pneumatic systems
   - Hydraulic systems
   - Machine automation systems
   - Lubrication processes
   - Bearings and couplings
   - Belts and chain drives

NOTE: MSSC assesses core understanding of the key work activities and core technical knowledge and skills needed in high-performance manufacturing, as defined by MSSC Production Skill Standards. Given online, MSSC Assessments also help measure basic computer, problem-solving and analytical skills and one's ability to apply knowledge to specific situations identified in the assessments. There are no experiential or hands-on requirements for MSSC certification as it is expected that individual employers will determine those requirements based upon their own specific needs. MSSC does not require that individuals take MSSC courses prior to testing.

Nationally Recognized Certification (ACT-NCRC)

ACT® WorkKeys® NCRC®

ACT PLATINUM WorkKeys NCRC

ACT certifies that

Jane P. Sample

has earned the ACT WorkKeys National Career Readiness Certificate™ at the Platinum level.

Registered Certificate # JSAMPLE001
Issue Date: 2/17/18

The **ACT WorkKeys National Career Readiness Certificate™** (ACT WorkKeys NCRC) is an assessment-based credential of widely applicable foundational employability skills. Individuals demonstrate skill mastery through their assessment scores. When individual skills are aligned to the skills needed for a job, workers tend to learn job-related tasks more quickly, benefit from on-the-job training, and obtain new knowledge and skills.

The certificate holder has earned a **Platinum ACT WorkKeys NCRC**. The certificate holder's Level Score on each individual assessment is provided below. The type of skills measured by each assessment are described at right.

Christine Nieto

ACT WorkKeys Applied Math	6
ACT WorkKeys Graphic Literacy	6
ACT WorkKeys Workplace Documents	7

ACT WorkKeys Applied Math
Level Score 6

You scored at Level 6. People who score at Level 6 have demonstrated all of the Levels 3, 4, and 5 skills. They also have demonstrated the following skills to:

- Use fractions with unlike denominators and calculate reverse percentages
- Convert units within or between systems of measurement (e.g., time, measurement, and quantity) where multiple-step conversions are required and the formulas are provided, such as converting from kilometers to meters to feet
- Identify why a mistake occurred in a solution
- Find the best deal from a group of solutions and then use the result for another calculation
- Find the area of basic shapes when it may be necessary to rearrange a formula, convert units of measurement in the calculations, or use the result in further calculations
- Calculate the volume of rectangular solids (e.g., cubes)
- Calculate rates, production rates, rate by time (such as, production rate is 59 cups produced per hour, how many will be produced in an 8-hour shift)
- Identify the correct equation for solving a problem

To find the Applied Math Levels 3, 4, and 5 skills, please refer to the ACT WorkKeys website at www.act.org/workkeys.

ACT WorkKeys Graphic Literacy
Level Score 6

You scored at Level 6. People who score at Level 6 have demonstrated all of the Levels 3, 4, and 5 skills. They also have demonstrated, using graphics designed at the highly complex level, the following skills:

- Locate information in a graphic using information found in another graphic
- Compare two or more pieces of information
- Identify a trend/pattern/relationship
- Make an inference or decision
- Identify the graphic that accurately represents the data

Additionally, using graphics designed at the high-moderate level, they have demonstrated the following skills:

- Compare two or more trends/patterns/relationships
- Interpret a trend/pattern/relationship
- Make a reasonable inference or decision based on one graphic after finding information in another graphic
- Justify an inference or decision based on information
- Identify the most effective graphic given a defined purpose
- Justify the most effective graphic given a defined purpose

To find the Graphic Literacy Levels 3, 4, and 5 skills, please refer to the ACT WorkKeys website at www.act.org/workkeys.

ACT WorkKeys Workplace Documents
Level Score 7

You scored at Level 7. People who score at Level 7 have demonstrated all of the Levels 3, 4, 5, and 6 skills. They also have the skill to read and comprehend long workplace documents that contain many details and are written in lengthy, complex sentences that use advanced vocabulary including esoteric words, jargon, and acronyms where meanings must be inferred from context. In reading these documents, they are able to:

- Infer implied details
- Infer the meaning of an acronym, jargon, or technical term from context
- Apply information/instructions to a situation not directly described in the document or to a completely new situation
- Apply principles inferred in a passage to a situation not directly described in the document or to a completely new situation
- Identify the rationale behind an entire document or a section of a document

To find the Workplace Documents Levels 3, 4, 5, and 6 skills, please refer to the ACT WorkKeys website at www.act.org/workkeys.

Earn Digital Badges: Digital Portfolio

Certified Production Technician (CPT) 4.0 Certification

Issued by Manufacturing Skill Standards Council

The purpose of the Certified Production Technician (CPT) ® 4.0 certification program is to recognize through certification, individuals who demonstrate mastery of the foundational, core competencies of advanced manufacturing production at the entry-level to front-line supervisor through successful completion of the certification assessments. The goal of the CPT 4.0 certification program is to raise the level of performance of production technicians.

Learn more

Certification | Foundational | Months | $ Paid

Skills Tags

Skills

Certified Production Technician (CPT) | MSSC Maintenance Awareness 4.0 Certification | MSSC Manufacturing Processes & Production 4.0 Certification | MSSC Quality Practices & Measurement 4.0 Certification | MSSC Safety 4.0 Certification

Earning Criteria

Credly

National Career Readiness Certificate Gold (v4)

Issued by ACT, Inc.

The National Career Readiness Certificate (NCRC) is an assessment-based credential comprised of the Applied Math, Graphic Literacy, and Workplace Documents assessments. The NCRC certifies essential skills relevant across industries and to multiple post-secondary pathways. Trusted by employers, the NCRC assessments are also administered statewide to juniors and seniors in over a dozen states and serve as the basis of workforce and economic development initiatives.

Skills Tags

Skills

Applied Math | Communication | Critical Thinking | Data Analysis | Evaluate Information | Gathering Information | Introduction to Organizational Communication | Math | Problem Solving | Quantitative Analysis | Reading | Reading Graphs

Level: Foundational

Earning Criteria

Earning Criteria

The credential verifies skill proficiency in: problem solving; critical thinking; reading and using work-related text; applying information from workplace documents to solve problems; applying mathematical reasoning to solve work-related problems; setting up and performing work-related mathematical calculations; locating, synthesizing, and applying information that is presented graphically; and comparing, summarizing, and analyzing information presented in multiple related graphics.

An examinee must earn a minimum level score of three on the three ACT NCRC assessments to earn an ACT NCRC. Based on the scores students earn on the assessments, the certificate is awarded at four levels - Bronze, Silver, Gold, and Platinum. Gold: Scores of Level 5 or higher on all three exams.

Endorsements

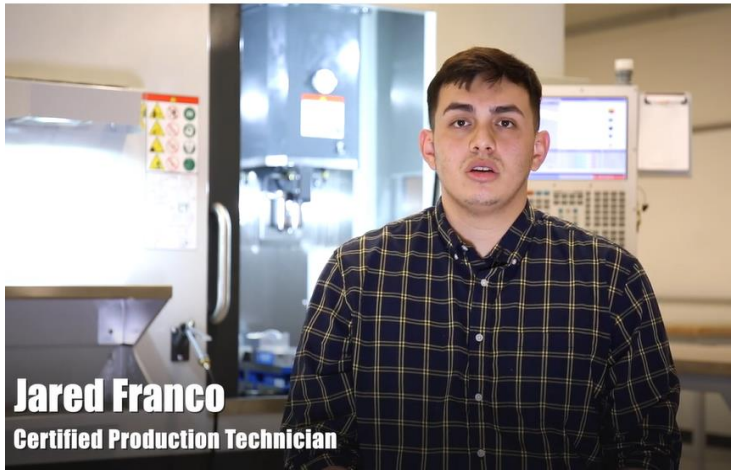
American Council on Education CREDIT

This credential has been successfully evaluated by the American Council on Education for college credit. It is recommended for a total of 4 college credits. For more information about ACE Learning Evaluations, visit www.acenet.edu.

Stack certificates and stand out to an employer

Student Value

Value and benefits to students:



- Document skills and knowledge in a short period of time at a low cost
- Obtain industry recognized, nationally portable credential
- Improve career advancement opportunities and earnings
- Enhances transferable skills applicable to all sectors of manufacturing or logistics

The CPT and CLT are both accredited under ANSI-ISO 17024 (Personnel Certification) making it the only national certification body globally with this designation for manufacturing and logistics.

Implementation Models

Successful Partnerships

Imbed credentialing programs in secondary and post-secondary

- For-credit
- Dual-credit
- Non-credit
- Credit for Prior Learning
- Competency-based Learning

Public & Private Partnerships

- Associations/ Chambers
- ED Groups
- City & State Governments
- Industry
- Secondary
- Post-secondary
- WIBs

Charity Organizations

- Goodwill
- United Way
- Easter Seals
- Salvation Army

Implementation Models:

Modular Courses: 45-55 hours each
3-credit equivalent:

- One course for each of the CPT modules
- Can be given in a **blended environment** with classroom instruction by an instructor or in a fully online format with an online instructor
- Recommended primarily for students and others studying in the framework of academic semesters or school years, dislocated workers or career changers.

Implementation Models:

E-Learning:

42 Online Interactive Units

24/7 Access

Targeted Instruction

- AMATROL - Main Library Content
  - Industry 4.0 Fundamentals
  - Automation
  - Electronics
  - Electrical
  - Fluid Power
  - Green Technology
  - Lean Manufacturing
  - Machining
  - Manufacturing Processes
  - Materials
  - Mechanical
  - Process Control
  - Quality Assurance
    - V11145-XA00XEN-E1 - Precision Gauging 1 (990-PG1)
    - VX11145-XA00XEN-E1 - Precision Gauging 1
    - V19017-CA00XEN-E1 - Measurement Tools 1 (950-MES1)
    - VX19017-CA00XEN-E1 - Measurement Tools 1
    - V19149-XA00XEN-E1 - Portable Measurement Tools (990-MES1)

High School Pre-Apprenticeship

Certified Production Technician 4.0 Training Program | CPT 4.0 & CPT+ 4.0 Skills

- **Pre-Apprenticeship:**
  - **CPT Training: 80 hours jr year and 80 hours sr year**
  - **On the Job Learning (OJL):**
    - **280 hours (8 weeks) in the summer of junior year &**
    - **280 hours (8 weeks) in the summer of senior year**
  - **A MSSC Certificate of Completion at the end**
  - **Pre-Requisite: ACT NCRC “Silver Level”**

Career Cluster: ***Manufacturing***	**CTE Program:** Secondary: **Advanced Manufacturing Technology (9200200)** Postsecondary: **State CIP Code 1615000001 Engineering Technology**
Career Cluster Pathway: ***Manufacturing Production Process***	**Industry Certification:** Secondary: **MSSC Certified Production Technician (CPT) (MSSCN001) & MSSC Certified Logistics Technician (MSSCN002)** Postsecondary: **MSSC Certified Production Technician (CPT) (MSSCN001)**

	16 CORE CURRICULUM CREDITS					8 ADDITIONAL CREDITS	
	ENGLISH 4 credits	**MATH** 4 credits	**SCIENCE** 3 credits, 2 with lab	**SOCIAL STUDIES** 3 credits	**OTHER REQUIRED COURSES** FINE ARTS (1 credit) PHYSICAL EDUCATION (1 credit)	**CAREER AND TECHNICAL EDUCATION COURSES**	**RECOMMENDED ELECTIVES** (ALIGNED WITH COMMUNITY COLLEGE & STATE UNIVERSITY SYSTEM PROGRAMS)
HIGH SCHOOL	• Students are encouraged to begin planning for careers and postsecondary options by exploring resources at mycareershines.org • Students are also encouraged to participate in dual enrollment courses which may be used to satisfy high school graduation or Bright Futures Gold Seal Vocational Scholars course requirements. • One course within the 24 credit program must be an online course. Cumulative GPA of 2.0 on a 4.0 scale for 24 credit program						
9th	English I	Algebra I	Earth, Space Science	Elective	Pers Fit (.5 cr) & Ph Ed (.5 cr)	Advanced Manufacturing Technology 1	Elective/Foreign Language
10th	English II	Geometry	Biology	American History		Advanced Manufacturing Technology 2	Elective/Foreign Language
11th	English III	Algebra II	Chemistry	World History	Practical Arts or Fine Arts course (1 credit)	Advanced Manufacturing Technology 3	Advanced Manufacturing Technology Capstone
12th	English IV	Statistics	Physics	Am Govt/ Economics		Advanced Manufacturing Technology 4	Manufacturing Directed Study

POSTSECONDARY			
	Based on the Career Cluster of interest and identified career and technical education program, the following postsecondary options are available.		
	TECHNICAL CENTER PROGRAM(S)	**COMMUNITY COLLEGE PROGRAM(S)**	**UNIVERSITY PROGRAM(S)**
		Northwest Florida State College AS – Engineering Technology – Mechanical Design & Fabrication Specialization Option	**University of West Florida** Bachelor of Science Mechanical Engineering

CAREER			
	Sample Career Specialties (The Targeted Occupations List may be used to identify appropriate careers.)		
	• Electronic Assembler • Production Technician • Logistics Technician • Quality Technician • Maintenance Technician	• CNC Machinist • CNC Fabricator • Engineering Technician • Mechanical Engineering Technician	• Mechanical Engineer

Okaloosa County Schools (Florida)

Source: https://www.mycteworks.com/pdf/2022-2023_AdvManufPOS_UPDATED.pdf

Work Based Learning

Community College EV Production Technology (Statewide-24 campuses)

Electric Vehicle Production Technology

CIP Code: 09.15.0613.03

Program Description:

The Electric Vehicle Production Technology program is a 864-clock hour program. It is designed as a pathway for secondary students to be prepared for careers in electric vehicle production facilities. This program meets the electric vehicle manufacturer entry-level production technician needs. Graduates will complete lectures and hands-on instructional activities that equip them with the knowledge, skills, and abilities of advanced manufacturing processes and procedures related to EV manufacturing. In addition, the Manufacturing Skills Standards Council's (MSSC) Certified Production Technician (ver. 4.0) is integrated into the program.

tbr | THE COLLEGE SYSTEM of TENNESSEE

Source: https://catalog.tbr.edu/preview_program.php?catoid=1&poid=704

Community College EV Production Technology

Electric Vehicle Production Technology Pathway (TCAT)

tbr | THE COLLEGE SYSTEM of TENNESSEE

Applicable Certification/License or Industry-recognized Certificates to Be Awarded:

- National Career Readiness Certificate (NCRC)
- MSSC's Certified Production Technician (CPT)
  - Safety
  - Quality
  - Manufacturing Processes and Production
  - Maintenance Awareness IC3 Digital Literacy (NC3)
- FANUC Certified Robot Operator 1
- Introduction to Manufacturing (NC3)
- Precision Measurement (NC3)
- Six Sigma White Belt

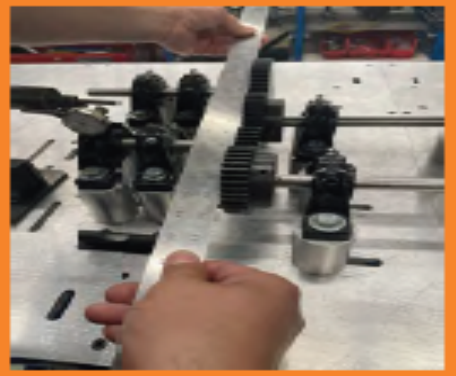
Trade School: Short Term Programs

Certified Production Technician Plus - Introduction to Manufacturing

VOLT Institute's CPT+ training program utilizes the Manufacturing Skill Standards Council {MSSC) Work Standards for Production and are organized around four key activity areas:

- Safety
- Quality Practices & Measurements
- Manufacturing Processes & Production
- Maintenance Awareness

No Cost
Tuition funded by City of Modesto



9 Weeks to a Career in Manufacturing

Classes Start Monday, March 27, 2023 Monday - Tuesday - Wednesday
8:00am to 11:00am
1310 I Street, Modesto

Space is limited

Sign up today at www.voltinstitute.com

MSSC

CPT+

Certified Production Technician Plus

VOLT INSTITUTE

www.voltinstitute.com
(209) 566-9102
info@voltinstitute

OPPORTUNITY Stanislaus

MODESTO CALIFORNIA

Connections to Careers

ACT® WorkKeys®

Occupations aligned with CPT Certifications

CPT

The Manufacturing Skill Standards Council and ACT

Stacking Credentials Opening Doors

MSSC and ACT have partnered to provide a stackable certification for next-generation careers. The partnership has a 10-year proven track record with job placement rates of 70-90%.

Median WorkKeys skill levels for entry into these occupations are derived from the ACT WorkKeys Profile Database which includes over 22,000 job analyses for O*NET occupation titles. Additional data can be found at: http://jobprofiles.act.org/

Manufacturing Occupations Relevant to MSSC's CPT Certification	WorkKeys Median Skill Levels			Median Annual Wage 2021	Projected Job Openings 2021-2031
	Applied Math	Workplace Documents	Graphic Literacy		
Assemblers and Fabricators, All Other, Including Team Assemblers	3	3	3	$36,590	13,930
Timing Device Assemblers and Adjusters	3	4	3	$37,780	13,930
Inspectors, Testers, Sorters, Samplers, and Weighers	3	4	4	$44,600	6,430
First-Line Supervisors of Production and Operating Workers	4	4	4	$62,620	5,450
Packaging and Filling Machine Operators and Tenders	3	3	4	$36,640	5,440
Electrical, Electronics, and Electromechanical Assemblers	3	3	4	$39,160	5,200
Production Workers, All Other	3	4	4	$36,590	4,410
Welders, Cutters, Solderers, and Brazers	3	3	4	$48,590	3,890
Machinists	4	4	4	$48,020	3,540
Helpers--Production Workers	3	3	3	$34,560	2,770
Sewing Machine Operators	3	3	3	$30,470	1,710
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	3	3	4	$45,310	1,590
Painters, Transportation Equipment	3	3	4	$45,310	1,590
Computer-Controlled Machine Tool Operators, Metal and Plastic	4	4	4	$47,510	1,560
Mixing and Blending Machine Setters, Operators, and Tenders	3	4	4	$44,140	1,330
Printing Press Operators	3	4	4	$38,970	1,190
Cabinetmakers and Bench Carpenters	4	4	4	$38,710	1,190
Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic	3	3	4	$35,930	1,100

Manufacturing Occupations Relevant to MSSC's CPT Certification	WorkKeys Median Skill Levels			Median Annual Wage 2021	Projected Job Openings 2021-2031
	Applied Math	Workplace Documents	Graphic Literacy		
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	4	3	3	$36,830	600
Cutting and Slicing Machine Setters, Operators, and Tenders	3	3	4	$37,760	530
Molders, Shapers, and Casters, Except Metal and Plastic	3	3	4	$44,110	530
Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	3	4	4	$37,970	530
Jewelers and Precious Stone and Metal Workers	3	3	4	$48,810	480
Semiconductor Processors	3	4	4	$44,660	480
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	3	3	4	$36,630	410
Structural Metal Fabricators and Fitters	3	3	4	$47,170	410
Medical Appliance Technicians	3	4	4	$46,910	410
Upholsterers	3	3	3	$37,790	360
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	3	4	4	$37,800	320
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	3	4	4	$46,680	300
Prepress Technicians and Workers	3	3	4	$47,300	300
Grinding and Polishing Workers, Hand	3	3	4	$36,880	300
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	3	3	4	$38,520	290
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	4	4	4	$47,730	270
Metal Workers and Plastic Workers, All Other	3	4	4	$37,460	260
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	3	3	4	$37,630	250
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	3	4	4	$45,920	250
Textile, Apparel, and Furnishings Workers, All Other	3	3	3	$30,500	250
Tool and Die Makers	4	4	4	$62,020	240
Furniture Finishers	3	3	3	$38,200	240
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	3	3	3	$36,540	240
Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	3	3	4	$48,620	220

Top Occupations in the EV Car Industry

1. Mechatronics technician
National average salary: $55,787 per year

2. Marketing manager
National average salary: $64,328 per year

3. Auto body technician
National average salary: $64,803 per year

4. Auto estimator
National average salary: $65,928 per year

5. Site surveyor
National average salary: $66,651 per year

6. Industrial designer
National average salary: $67,756 per year

7. Automotive service manager
National average salary: $67,796 per year

8. Car sales executive
National average salary: $70,873 per year

9. Mechanical engineer
National average salary: $82,274 per year

10. Chemical engineer
National average salary: $84,664 per year

11. Process engineer
National average salary: $84,688 per year

12. Electrical engineer
National average salary: $90,714 per year

13. Quality technician: $42,705 per year

Source: https://www.indeed.com/career-advice/finding-a-job/jobs-in-electric-car-industry

Reflections – 3 Takeaways

1) How are you helping students explore career options in Advanced Manufacturing?

2) What strategies do you have to help students determine what career path may be right for them

3) How do you think the ACT-NCRC could help students think differently about their next steps?

4) How do you think the MSSC modules could help your CTE program?

MANUFACTURING SKILL STANDARDS COUNCIL

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Be a Champion - Forge Strong Partnerships - Make an Impact