

COMMUNITY COLLEGES

SAN DIEGO & IMPERIAL COUNTIES

CAREER EDUCATION

Why now is the
time,
**MANUFACTURING
OUTLOOK,**
and **HOW CAN WE
HELP?**



Ruishan Chow
Tina Ngo Bartel
October 14, 2022

Agenda

The changing face of manufacturing

Why is it important?

Labor Market Information

What are our employers saying?

Projects (2020-2022):

Industrial Automation/Maintenance

Quality in Manufacturing

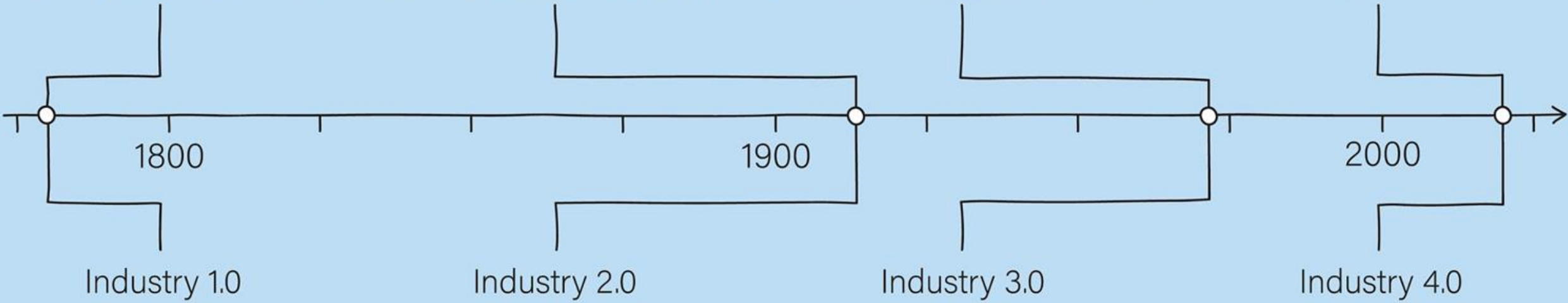
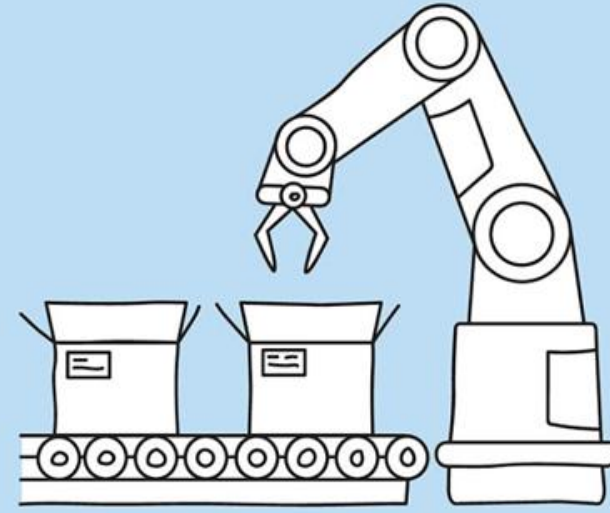
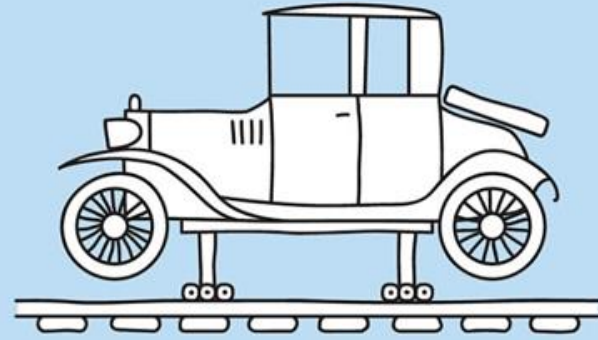
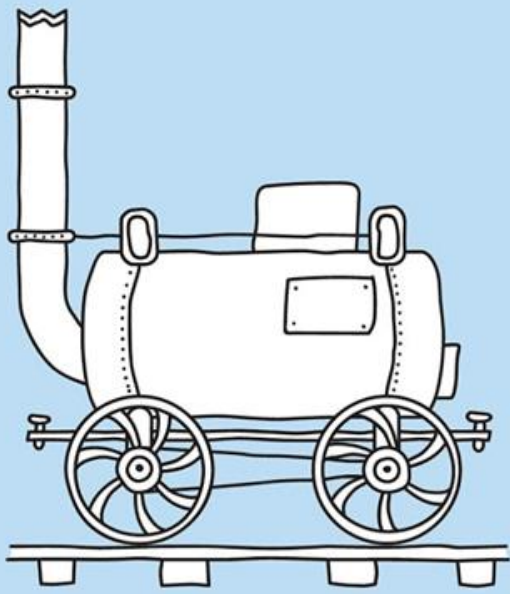
Looking forward

ADVANCED MANUFACTURING

Use of innovative technologies to create existing products and the creation of new products. Advanced manufacturing can include production activities that depend on information, automation, computation, software, sensing, and networking.

- MANUFACTURING.GOV





The Industrial Revolution begins. Mechanization of manufacturing with the introduction of steam and water power

Mass production assembly lines using electrical power

Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics

The 'Smart Factory'. Autonomous decision making of cyber physical systems using machine learning and Big Data analysis. Interoperability through IoT and cloud technology.

The Biden-Harris Plan to Revitalize American Manufacturing and Secure Critical Supply Chains in 2022

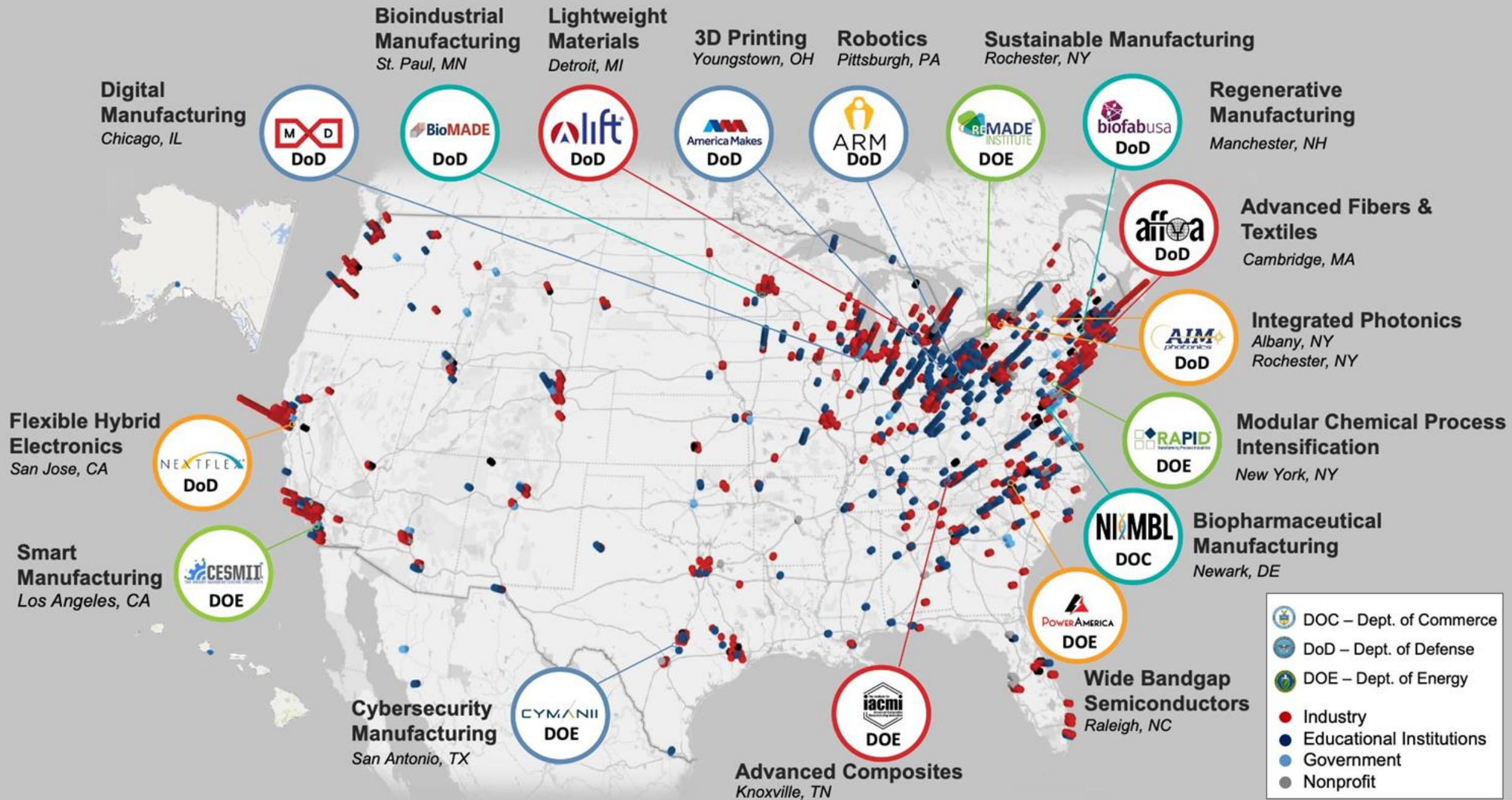
Whitehouse, February 24, 2022

CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China

Whitehouse, August 9, 2022

President Biden's Economic Plan Drives America's Electric Vehicle Manufacturing Boom

Whitehouse, September 14, 2022



An effective transformation of the US manufacturing sector could boost GDP by \$275 billion to \$460 billion while adding up to 1.5 million jobs.

Incremental 2030 GDP opportunity,¹ \$ billion (index 0 = 2020)

Low-end opportunity
 Additional optimistic opportunity

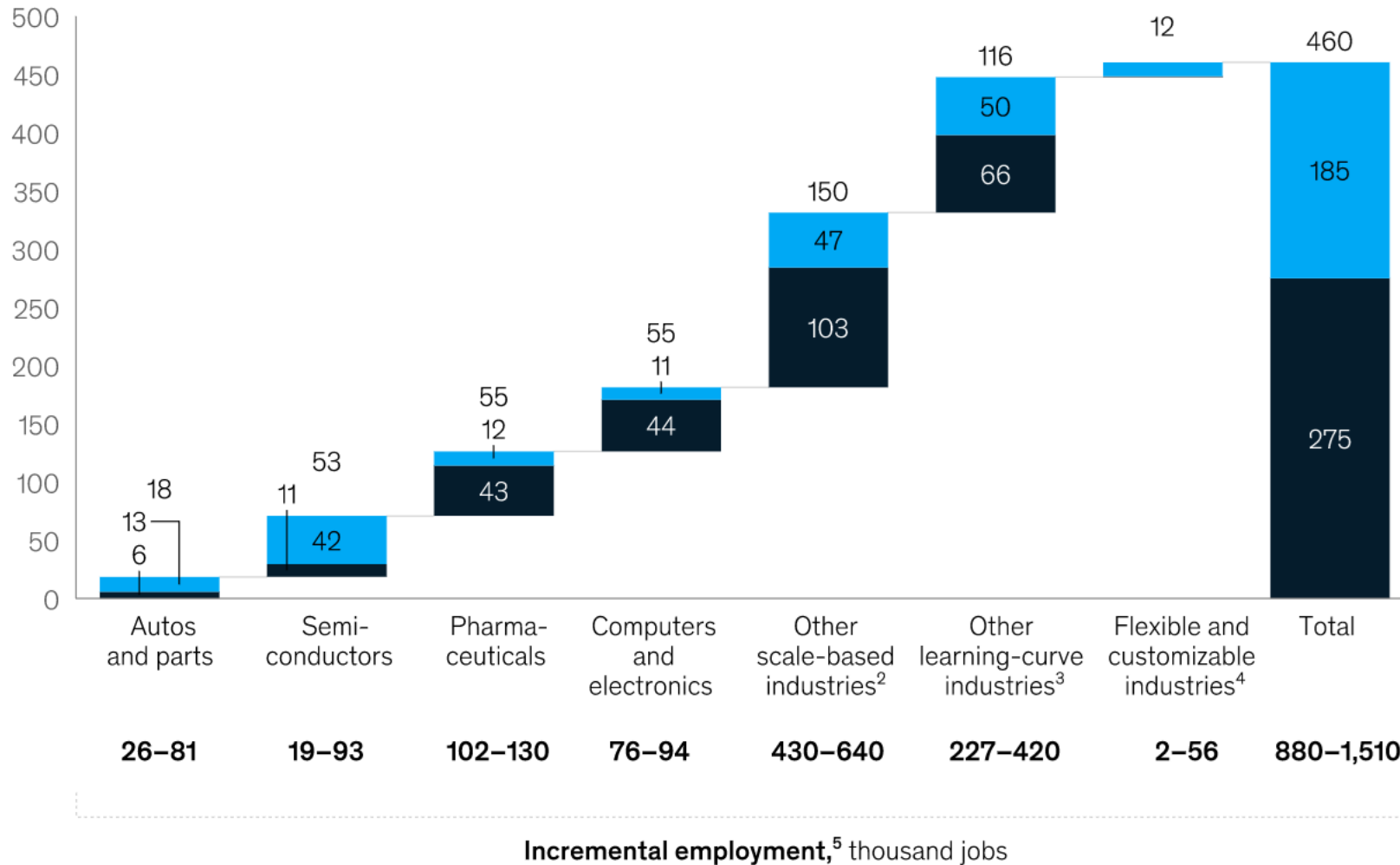
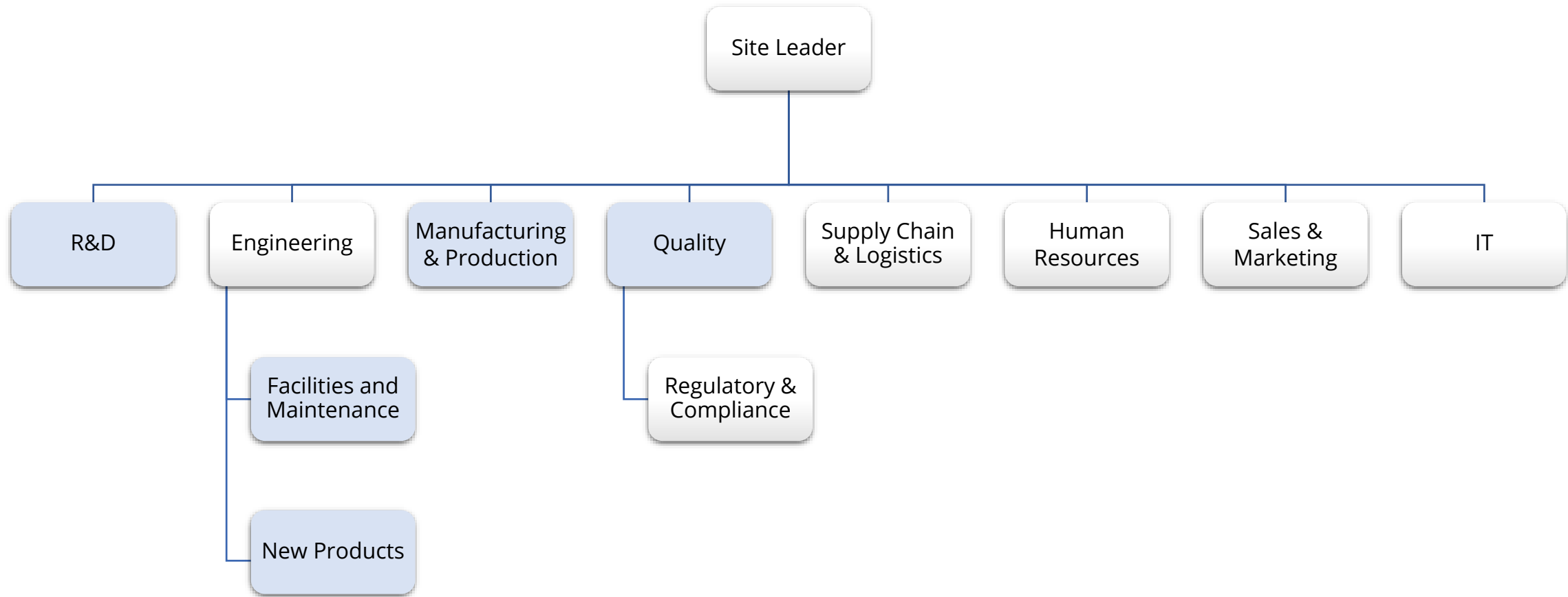
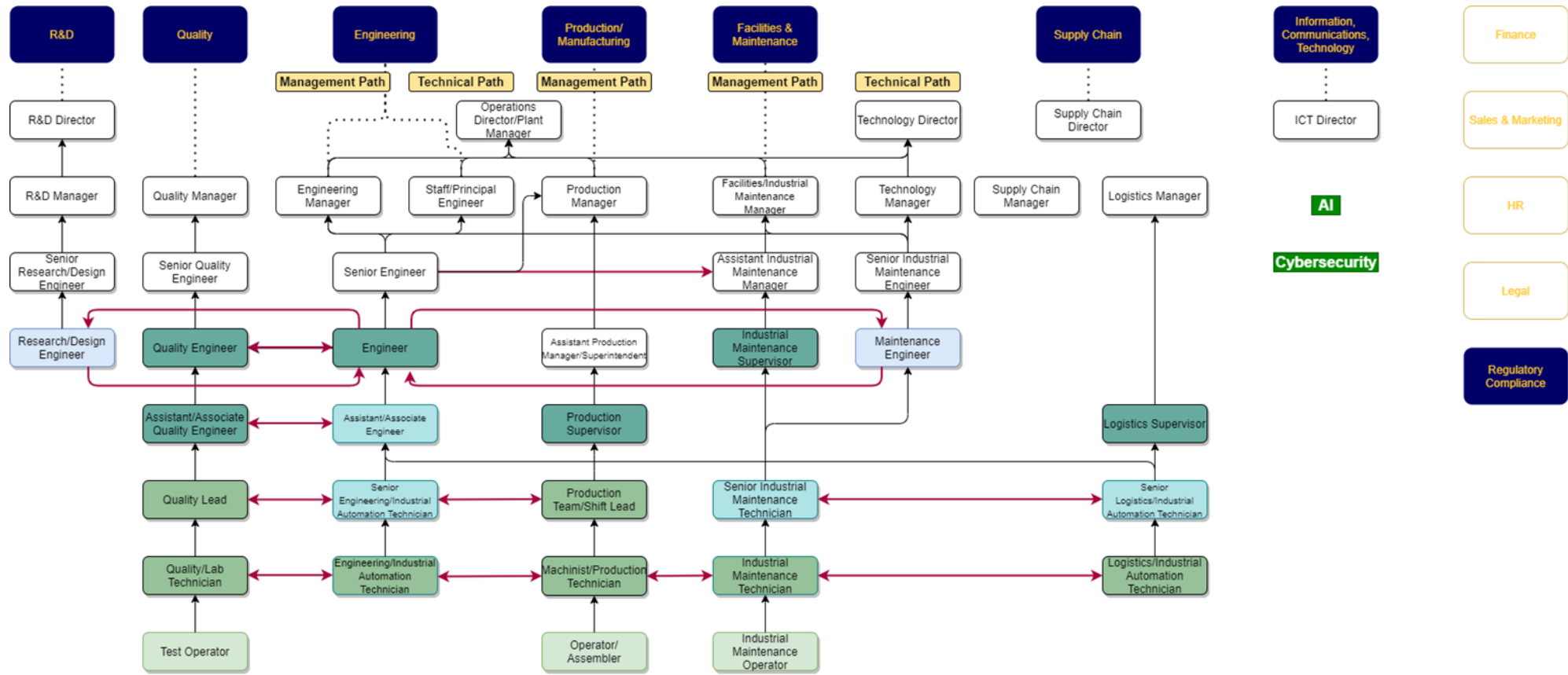


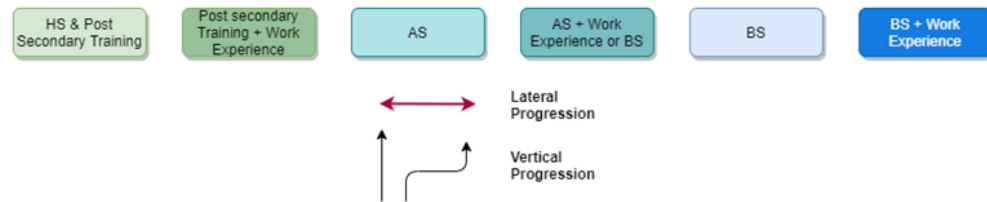
Figure 1. Incremental employment. Adapted from "Delivering the US manufacturing renaissance" by McKinsey & Company. Retrieved from: <https://www.mckinsey.com/capabilities/operations/our-insights/delivering-the-us-manufacturing-renaissance>



Typical organizational chart



LEGEND





Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes (CAD, CAM, production assembly, welding, etc)



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

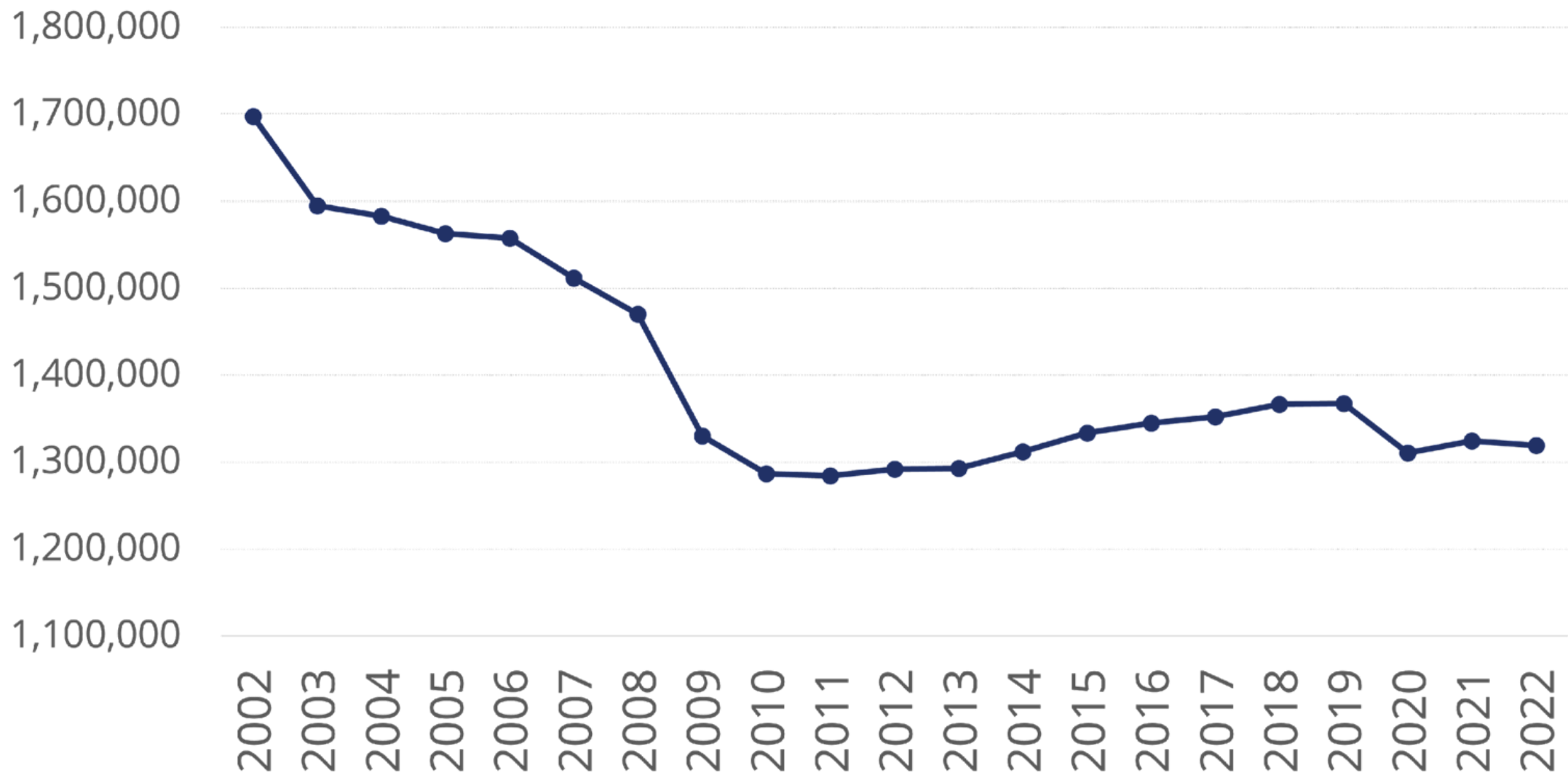
Labor Market Information (LMI)

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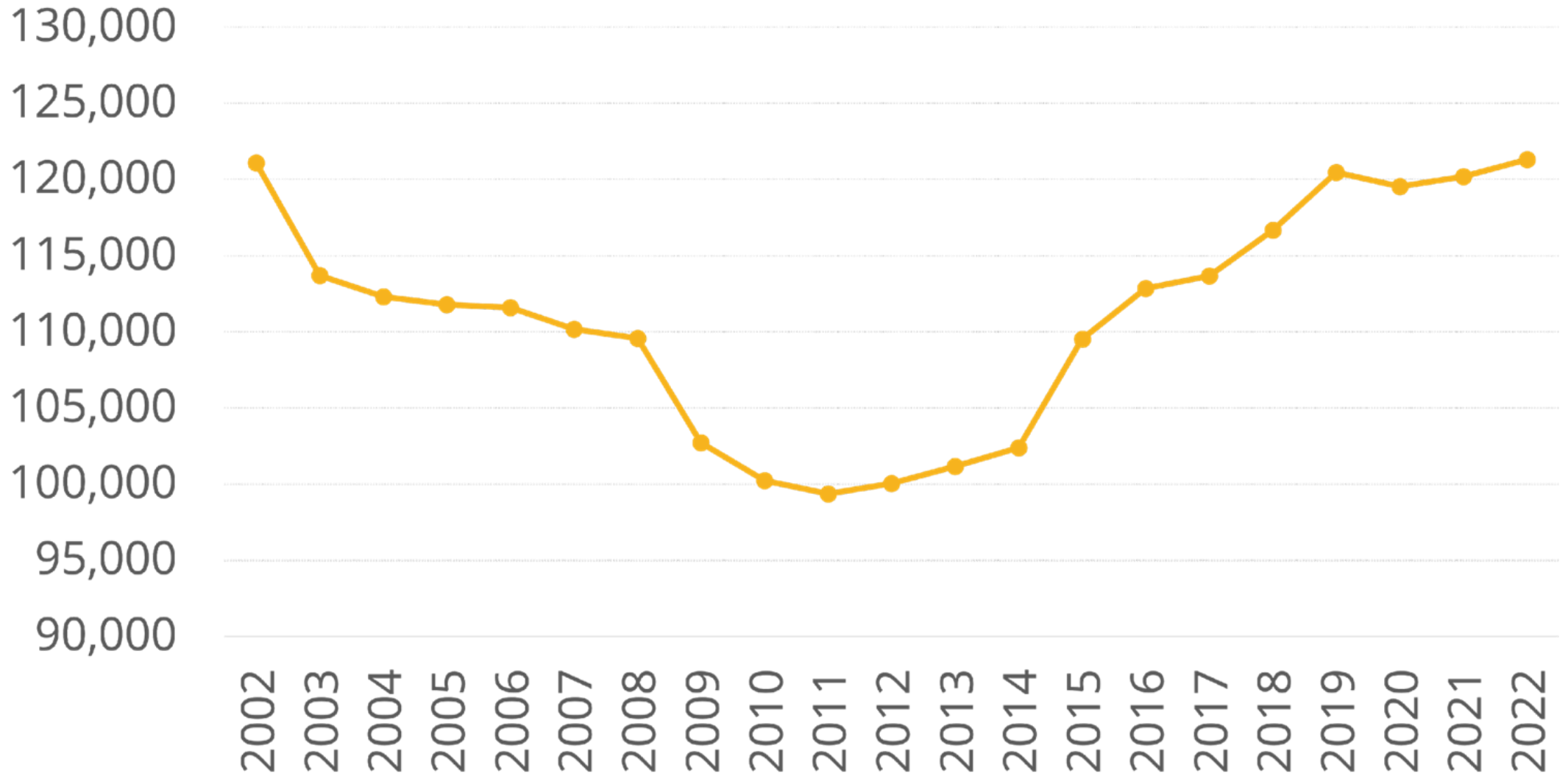
SAN DIEGO & IMPERIAL COUNTIES

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MANUFACTURING JOBS: CALIFORNIA



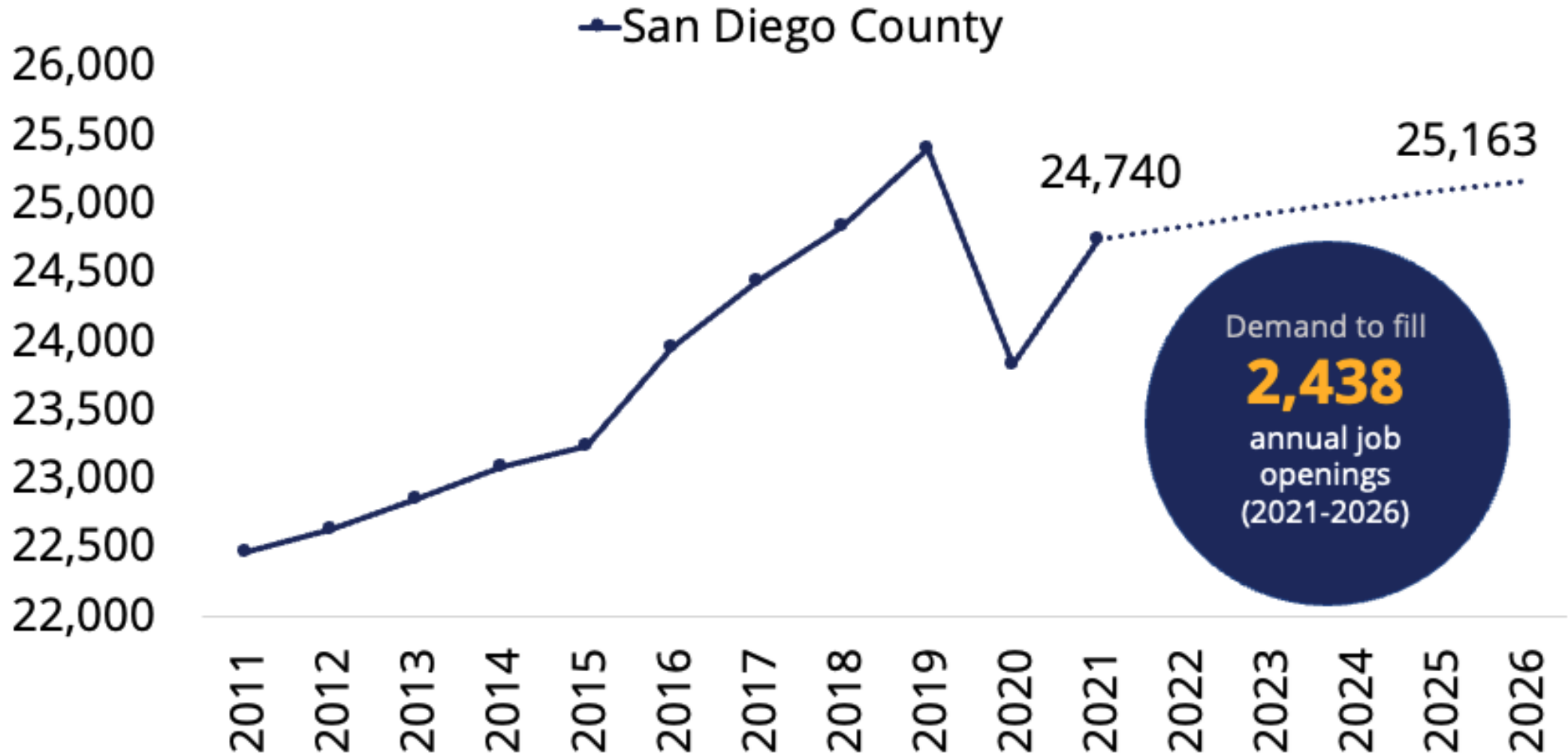
MANUFACTURING JOBS: SAN DIEGO-IMPERIAL

**HIGH
DEMAND
FOR...**

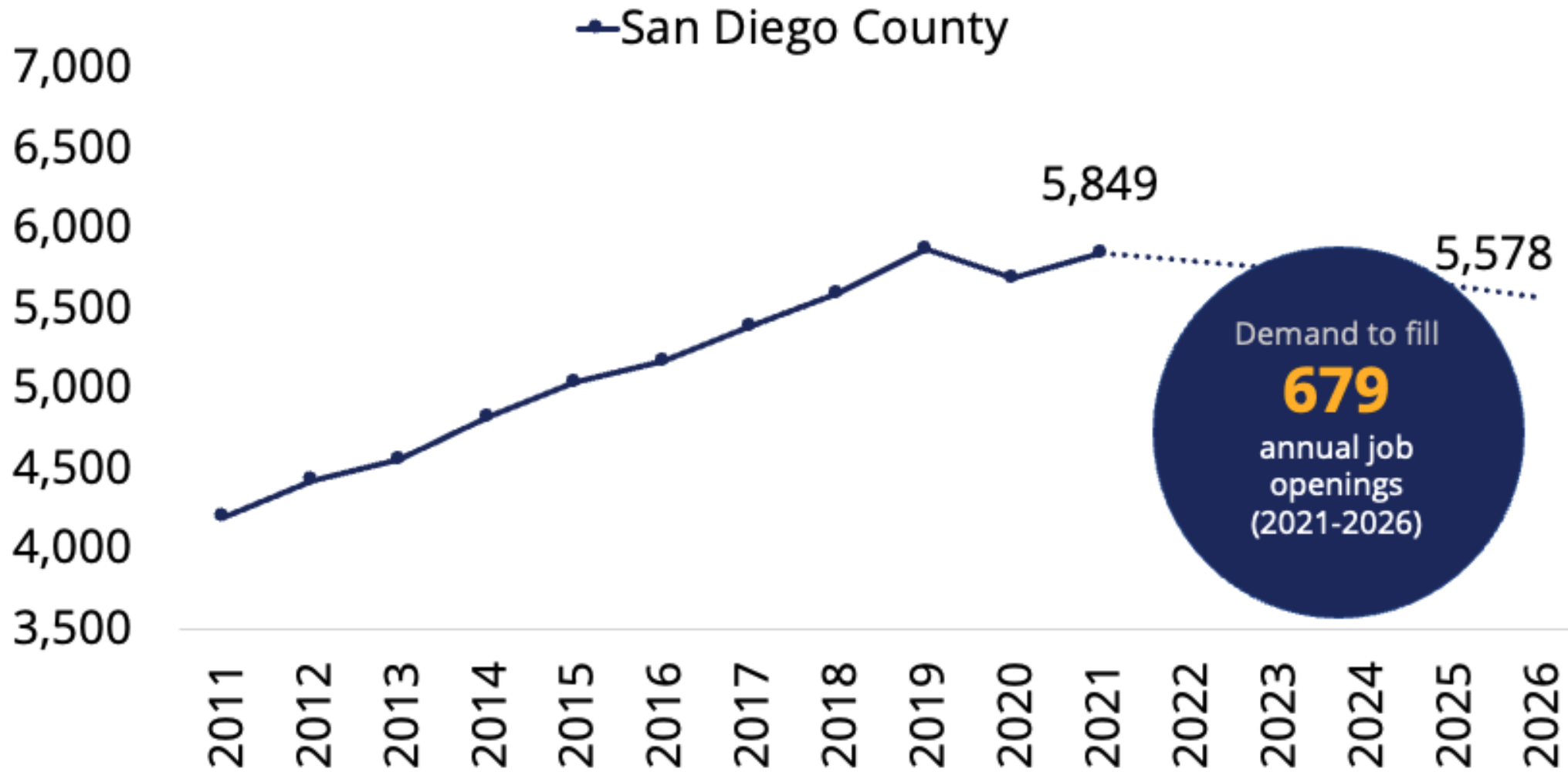
**INDUSTRIAL
AUTOMATION
Occupations**

**QUALITY
Occupations**

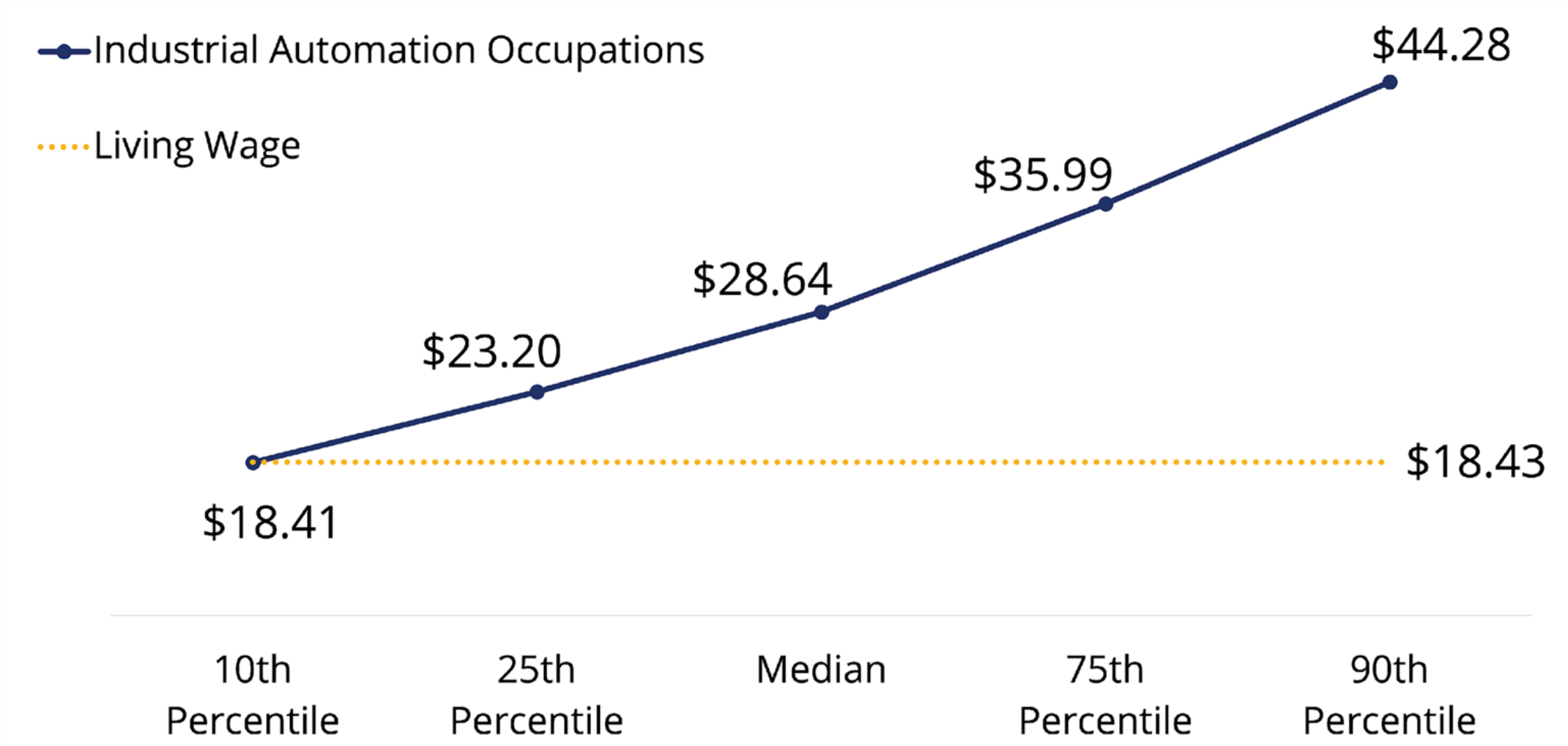
...IN MANUFACTURING



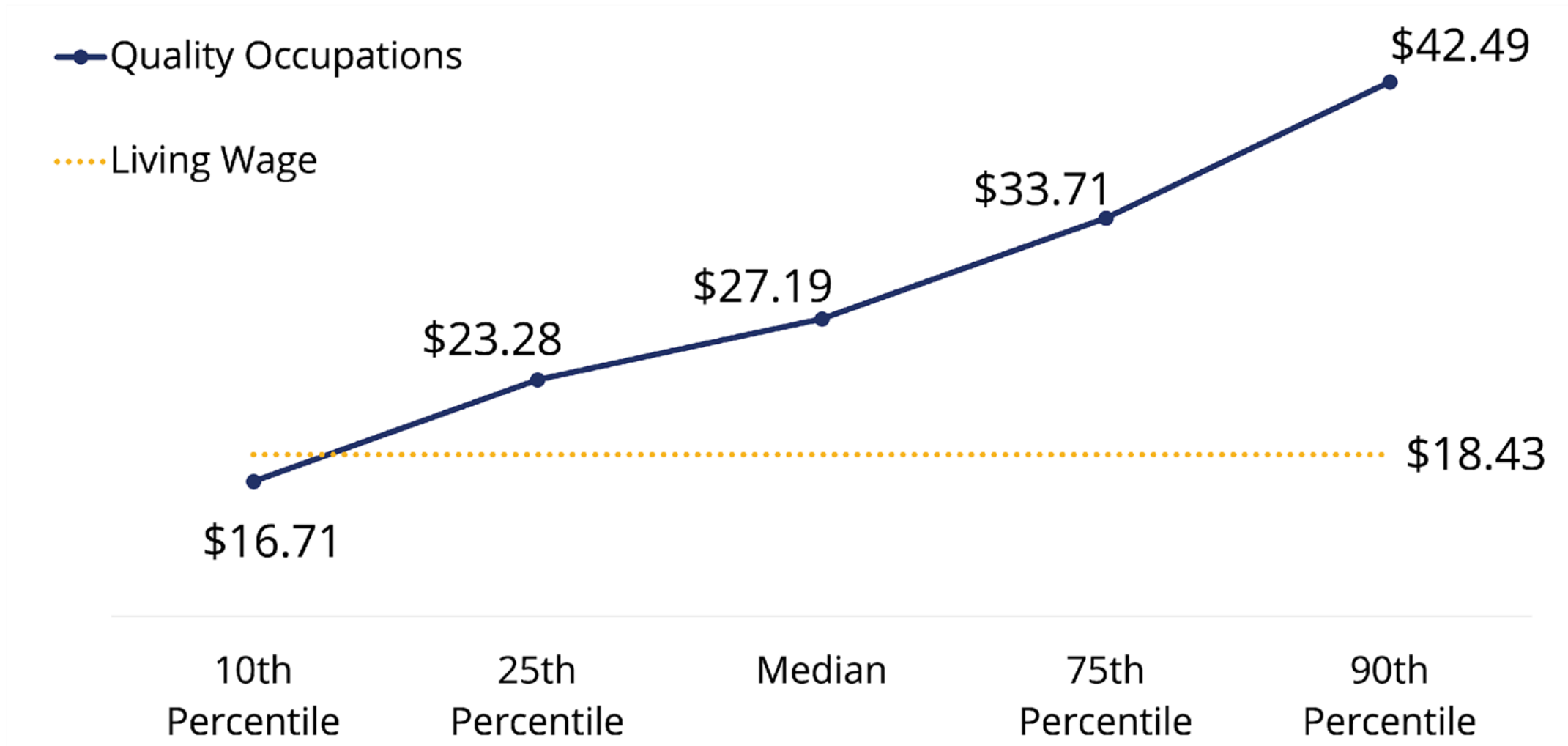
JOBS: INDUSTRIAL AUTOMATION OCCUPATIONS



JOBS: **QUALITY OCCUPATIONS**

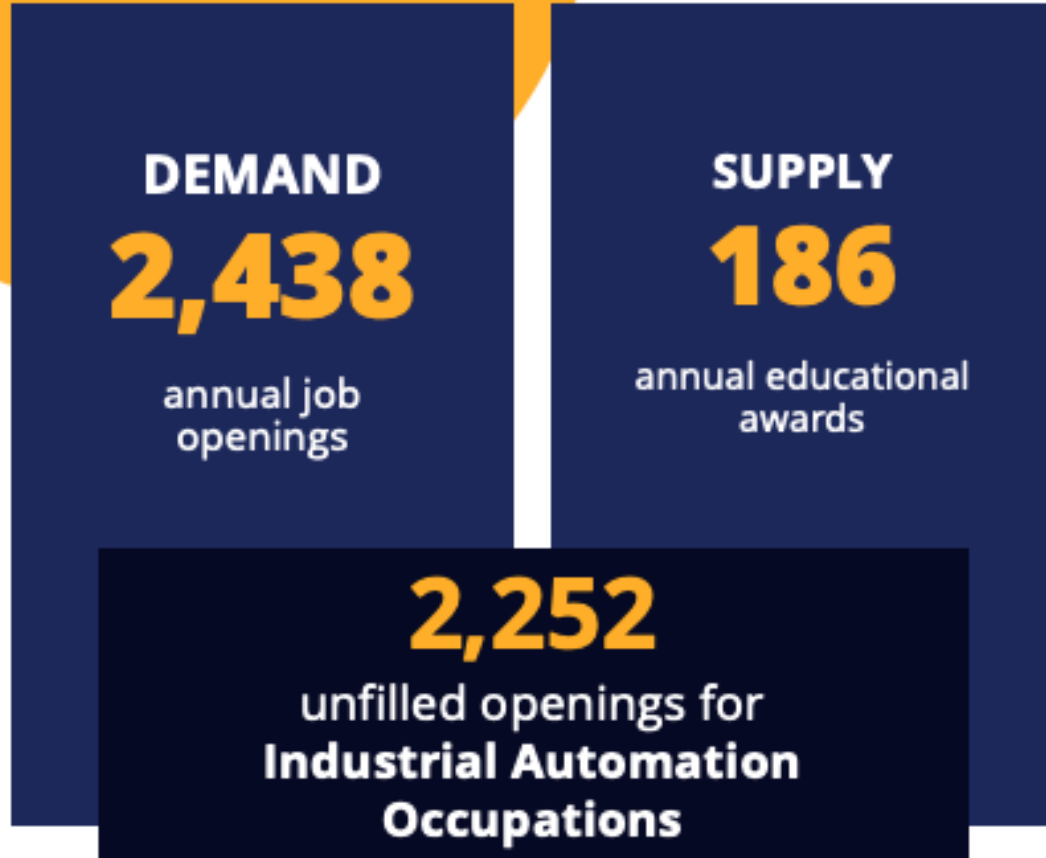


WAGES: INDUSTRIAL AUTOMATION OCCUPATIONS



WAGES: QUALITY OCCUPATIONS

SUPPLY GAPS



Employer Panel

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Moderator

Panelists



Amanda Cheyney
Business Advisor, CMTTC



Dan Bauer
Manager, Metrology and Test
Systems, Solar Turbines



Rick Urban
COO/CFO, QCFMI



Robin Brown-Whiston
HR Leader, IDEX Corporation



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

Sector Strategy Projects

#1: Industrial Automation/Maintenance

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Data Acquisition & Analytics



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Automation Systems



Manufacturing Processes (CAD, CAM, production assembly, welding, etc)



Quality



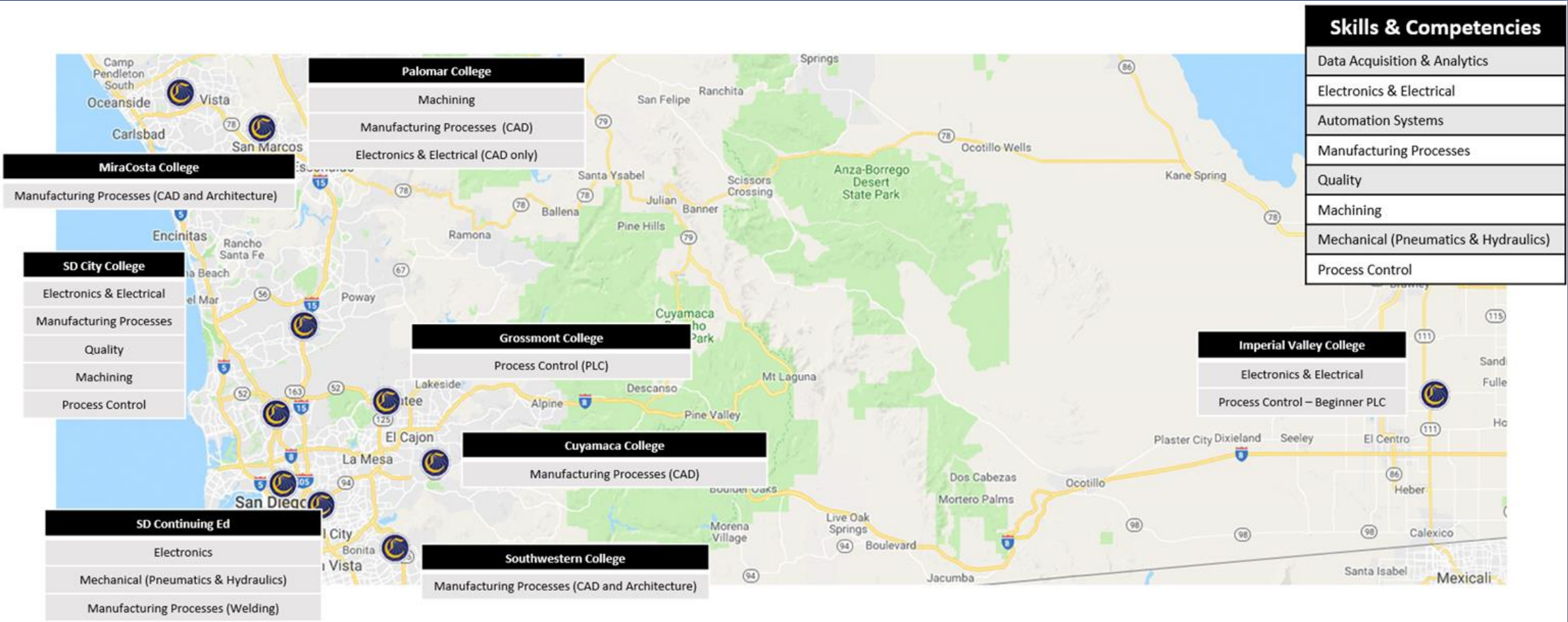
Machining



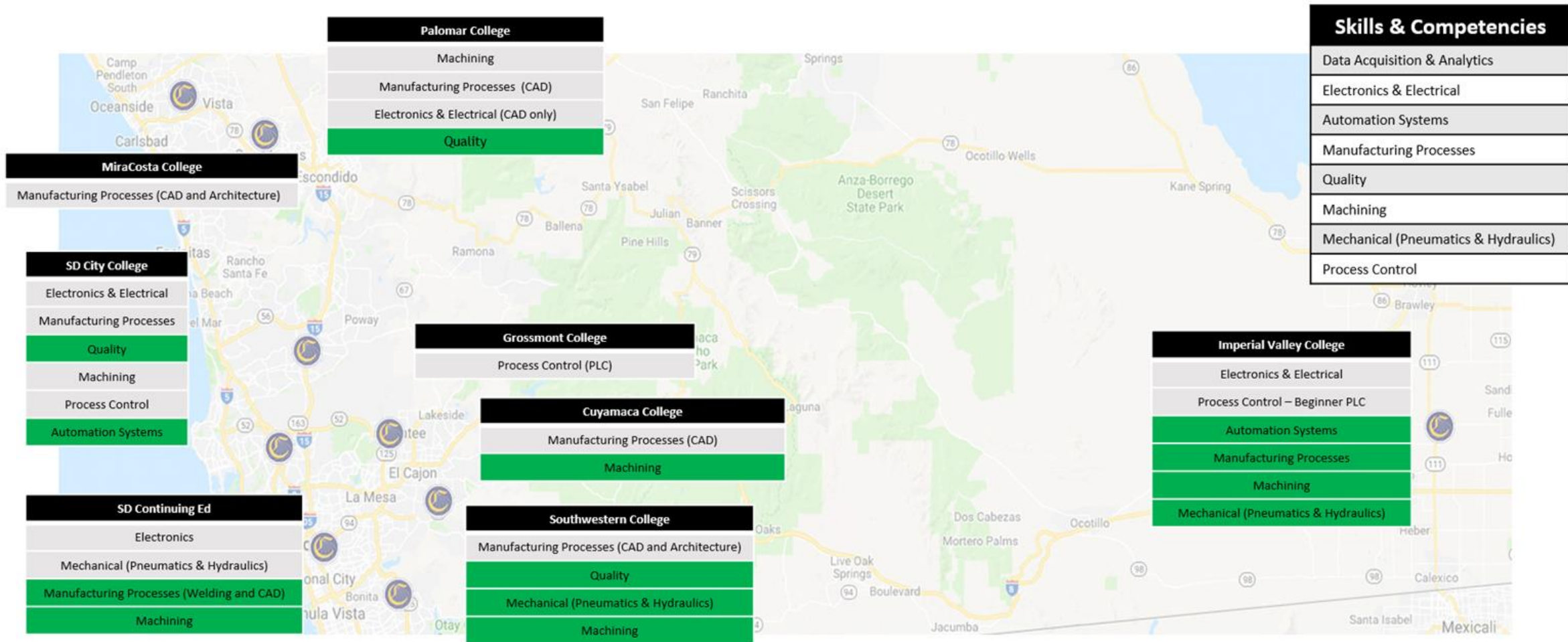
Mechanical (Pneumatics & Hydraulics)



Process Control



Skills & Competencies	
Data Acquisition & Analytics	
Electronics & Electrical	
Automation Systems	
Manufacturing Processes	
Quality	
Machining	
Mechanical (Pneumatics & Hydraulics)	
Process Control	




Skills & Competencies
Data Acquisition & Analytics
Electronics & Electrical
Automation Systems
Manufacturing Processes
Quality
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Process Control


Strong Workforce Sector Investment Recipient


- New course in advanced CAD manufacturing (machining) using new software
- Purchased equipment

Next steps:


- Solidify machining curriculum and integrate it with existing CAD curriculum
- Partner with Engineering
- Approve for **Fall 2023**

 Data Acquisition & Analytics


 Electronics & Electrical


 Automation Systems

 Manufacturing Processes

 Quality

 Machining

 Mechanical (Pneumatics & Hydraulics)

 Process Control

Cuyamaca College

Current Program:

- Computer Science Information Systems – Programmable Logic Controller



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

Grossmont College

Strong Workforce Investment Recipient

- 3 certificates, 1 AS degree approved
 - Industrial Automation Technology, AS Degree
 - Instrumentation Technician - **Fall 2023**
 - Plant Operator - **Fall 2023**
 - Lab Technician
- Equipment purchase for Industrial Automation Technology program

Next steps:

- Equipment purchase for new certifications that will start in Fall 2023
- Identify equipment to purchase for Lab Technician certification



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

Imperial Valley College

Current programs:

- Design program: CAD
- Quality courses in Biomanufacturing programs

Next steps:

- Administrative 5-10 year plan for Industry 5.0



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

MiraCosta College

Strong Workforce Sector Investment Recipient

Noncredit Programs – Vista Detention Facility

- Pre-apprenticeship
- Welding
- Instructors onboard and ready

Next step: Waiting for Vista Detention Facility to open up

For Credit Programs:

- Composites Technician Program
- Quality Control Technician Certification – **2021**
- Metrology Lab

Next Steps:

- Mechatronics & Robotics (5-7 year plan) in collaboration with Engineering
- Re-brand to “Advanced Manufacturing”

- **Preferred Provider**



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

Palomar College

Strong Workforce Sector Investment Recipient

- Two new certifications
 - Automated Electronics Manufacturing - **Spring 2022**
 - Mechatronics and Total Productive Maintenance - **Fall 2023**
- Recruiting women in manufacturing bootcamp – 18 to 36% women
- Equipment relocation
- Dual Enrollment partnership with Kearny High School's Engineering Innovation Design (EID) Institute

Next steps:

- Faculty training
- Faculty hiring and additional administration help
- Equipment purchase – automated optical inspection
- Plan to apply for additional funds
- Marketing

- **Preferred Provider**



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

San Diego City College

Strong Workforce Investment Recipient

- Completed curriculum inventory
- Two new certificates
- Existing programs that can be leveraged:
 - Electronics
 - Welding
 - HVAC/pumbling
 - Automotive

Next steps:

- Equipment purchase once space is available
- Potentially pursuing Nondestructive testing certification



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



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Mechanical (Pneumatics & Hydraulics)



Process Control

San Diego College of Continuing Education

Strong Workforce Sector Investment Recipient

- Completed curriculum inventory
- Industry and academia partnerships with high schools and other departments within SWC campus (Architecture, CAD, engineering)
- Increase in WBL opportunities

- 2 new noncredit CDCP certificates - **Spring 2023**
 - Manufacturing Technology Program (150hrs)
 - Maintenance Technology Program (150hrs)

Next steps:

- Equipment purchase
- Facility Upgrade
- Marketing



Data Acquisition & Analytics



Electronics & Electrical



Automation Systems



Manufacturing Processes



Quality



Machining



Mechanical (Pneumatics & Hydraulics)



Process Control

Southwestern College

Sector Strategy Projects

#2: Quality



Quality Control

- Product focused
- Inspections
- Verify Quality
- Detection of defects
- Statistical Process Control
- Raw Material Control

Quality Assurance

- Process focused
- Audits
- Manages Quality
- Prevention of defects
- Document Control
- Risk Management

How do we fit in?

Source: Decode. (2021). Quality assurance vs. quality control. Retrieved from: <https://decode.agency/article/quality-assurance-vs-quality-control/>



Quality Inspection and Quality Assurance

Quality Technician

Nondestructive Testing (NDT)

Quality Management Systems (only)

Lean Six Sigma Yellow Belt

Lean Six Sigma Green Belt

Quality Management or Quality Engineering Technology

Possible Interventions

- Curriculum Development
- Faculty Training and Internal Capacities
- Successful New Program Launch
 - Strategies:
 - Marketing for awareness
 - Recruitment and enrollment applications
 - Student retention
 - WBL & Job placements

Looking forward



Questions?

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THANK YOU!

LET'S TALK!

Ruishan Chow
Tina Ngo Bartel