

Trends in Manufacturing & Returning Manufacturing to San Diego

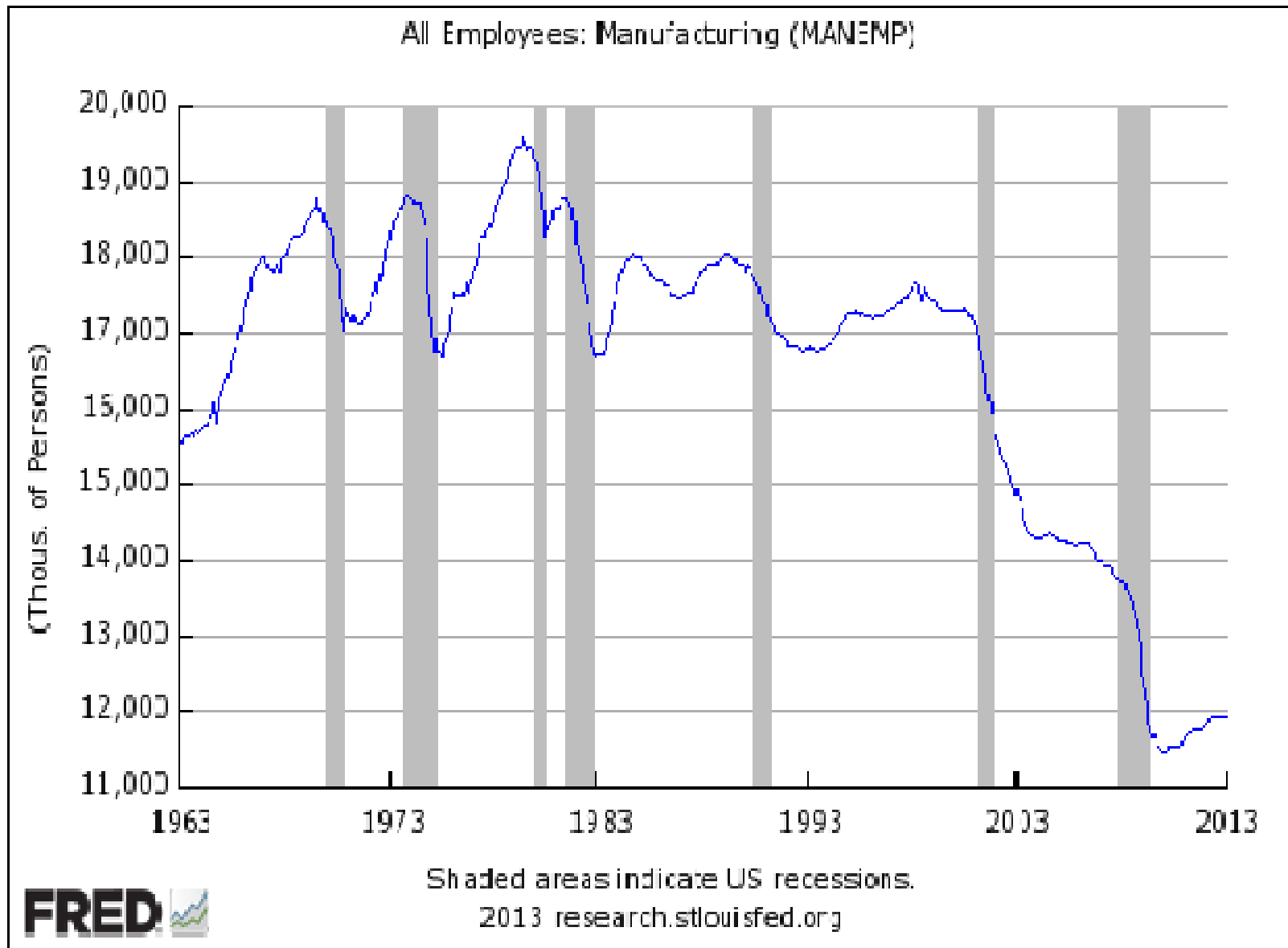
Michele Nash-Hoff

President, ElectroFab Sales

A manufacturers' sales agency specializing
in fabrication services

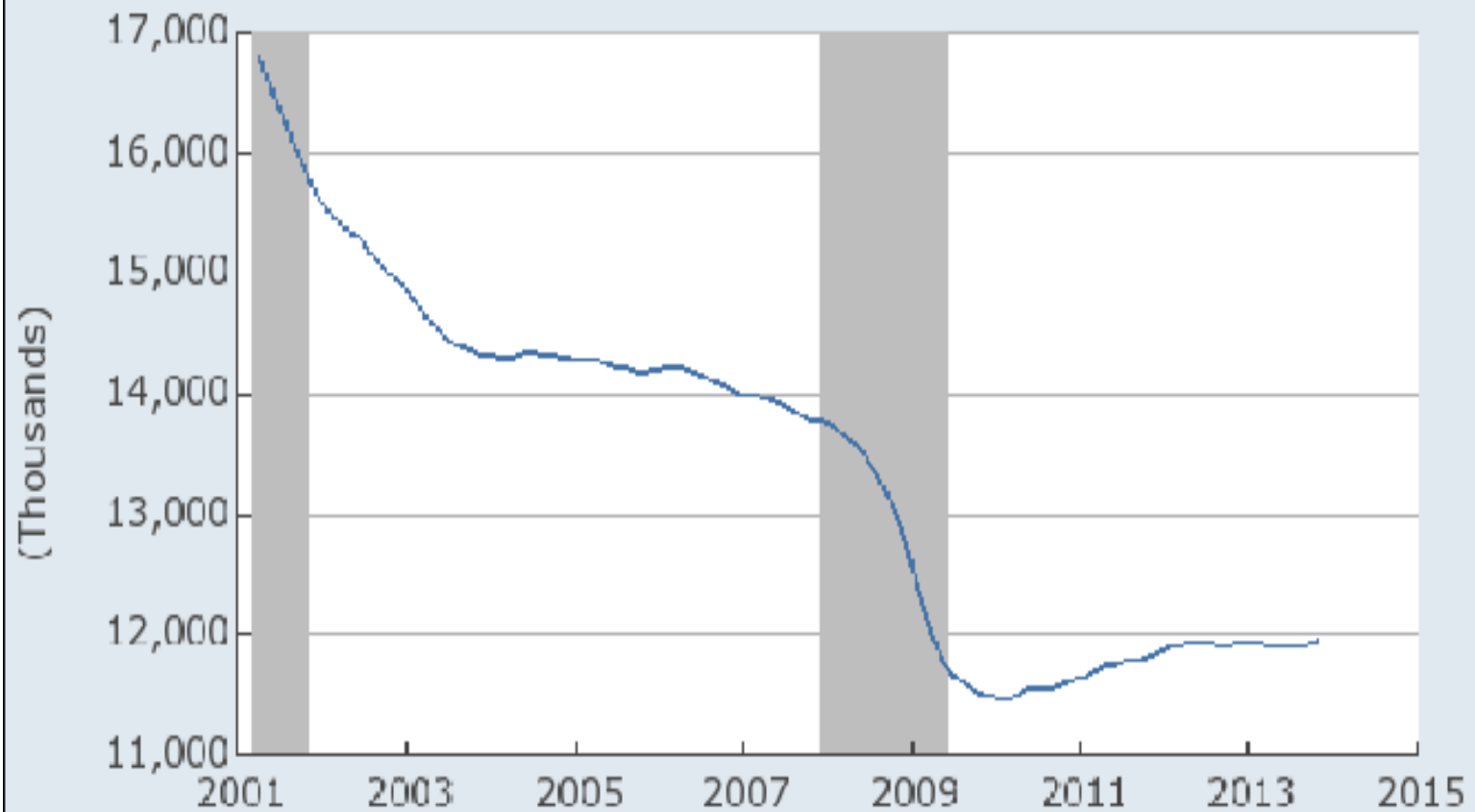
San Diego Manufacturing Trends

- San Diego Still Lost Manufacturing Jobs in 2013
- “Reshoring”/Resurgence of “Made in USA”
- Additive Manufacturing
- Training to meet Manufacturing Skills Gap
- Inventors Choosing Licensing vs. starting a company



Nonfarm Private Manufacturing Payroll Employment (NPPMNF)

Source: Automatic Data Processing, Inc.

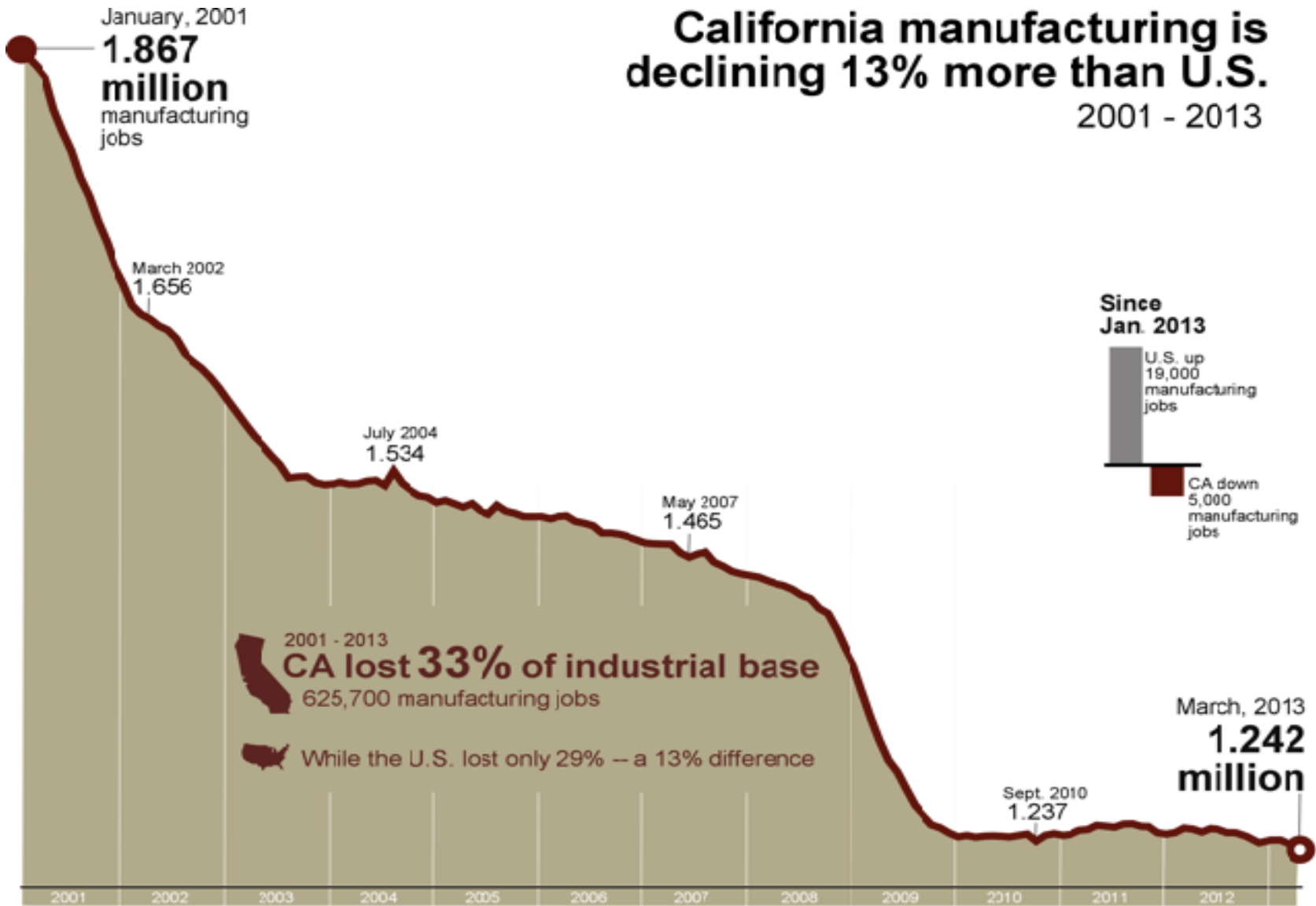


Shaded areas indicate US recessions.

2014 research.stlouisfed.org



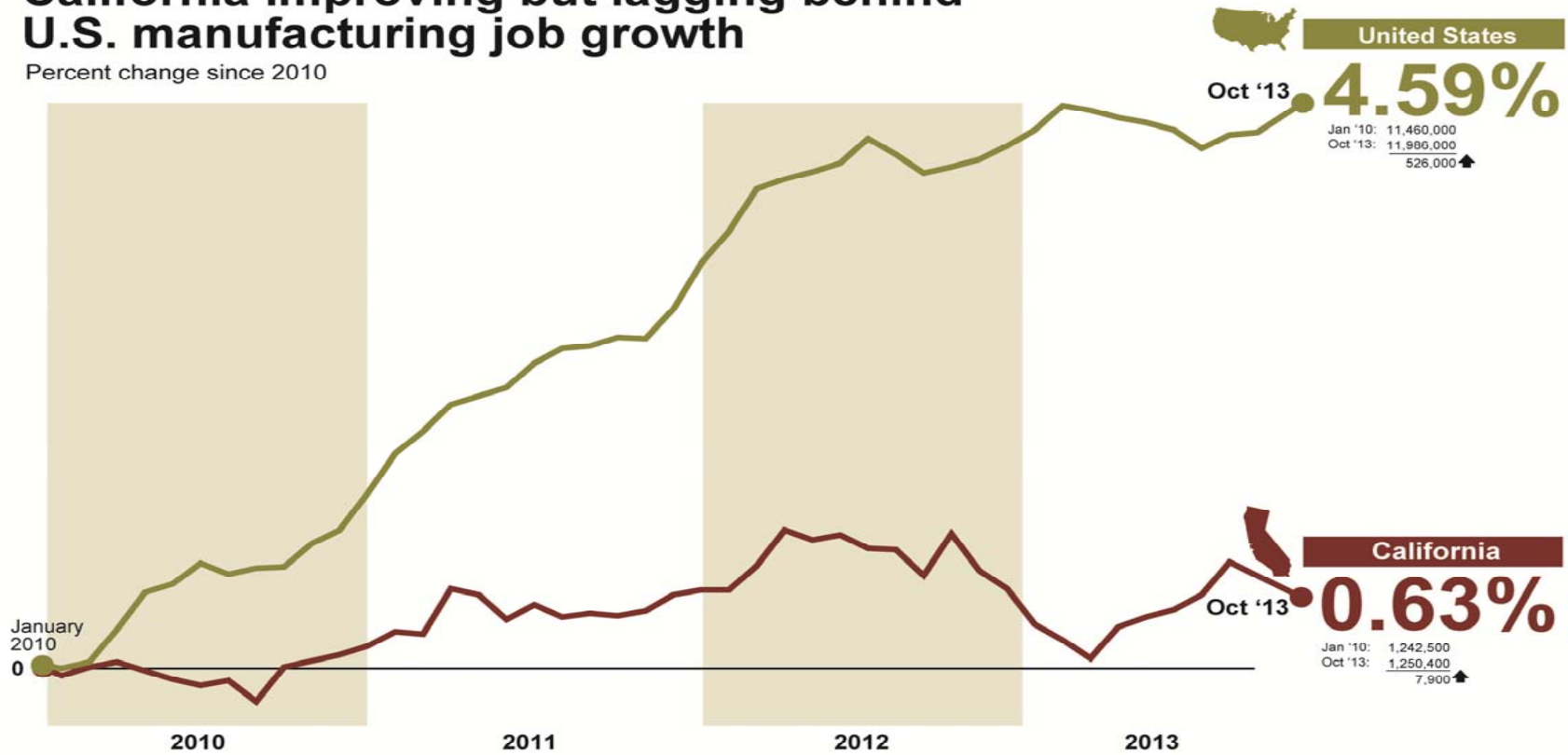
California manufacturing is declining 13% more than U.S. 2001 - 2013



Source: California Labor Market Information Department, U.S. Bureau of Labor Statistics Chart: CA Manufacturers & Technology Assn.

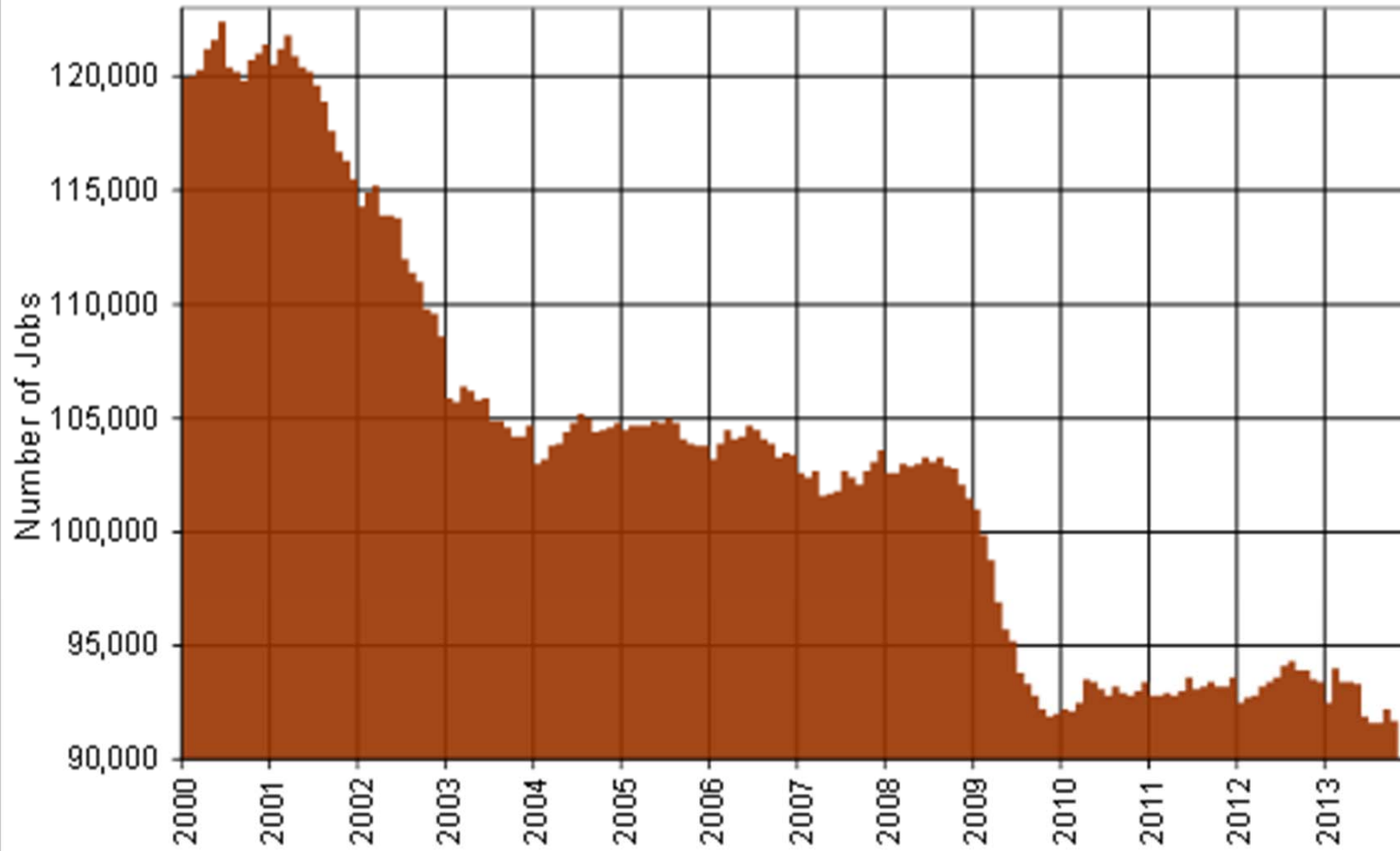
California improving but lagging behind U.S. manufacturing job growth

Percent change since 2010



Sources: Labor Market Information Dept, U.S. Bureau of Labor Statistics Chart: CA Manufacturers & Technology Assn. employment numbers are seasonally adjusted

San Diego Manufacturing Payroll Jobs



Source: California Employment Development Department; National University System Institute for Policy Research.

- From 2000 to 2011, the U. S. lost 5.8 million manufacturing jobs and 57,000 manufacturing firms closed.
- U.S. Department of Commerce shows that “U.S. multinational corporations... cut their work forces in the U.S. by 2.9 million during the 2000s while increasing employment overseas by 2.4 million.”

- Offshoring has been major cause of:
 - Slow economic growth after Great Recession
 - U.S and state budget deficits
 - High unemployment
 - Weakened middle-class
 - Declining innovation
 - Lower sales levels in weakened home market

Offshoring: partially herd behavior

- A 'herd' mentality to participate in the 'Chinese miracle' developed among giant global corporations --{Peter Nolan; University of Cambridge; - 9/03)
- People tell their bosses what they want to hear—(going to China) gives a boost to the stock valuation, but you really have to do the analysis on a case by case basis." (Technology Forecasters 10/03)

Source: Stone & Associates

- Most companies don't look beyond quoted unit price to make decision of which vendor to select.
- Should do Total Cost of Ownership (TCO) analysis - estimate of direct and indirect costs
- 13th edition APICS dictionary says:
 - "In supply chain management, the total cost of ownership of the supply delivery system is the sum of all the costs associated with every activity of the supply stream."

- Should expand TCO to include the physical length of the entire supply chain and the lead times associated with the entire process.
- TCO should include:
 - Transportation alternatives
 - Inventory costs and control
 - Cost of quality controls
 - Reserve capacity
 - Responsiveness
 - Technological depth

Offshore Supply Chain Dynamics Changing

- Oil prices - tripled in the last 5 years raising logistics costs
- Labor rates rose about 15% year-over-year last 5 years in China & 60% predicted this year
- Component/material prices increasing
- Automation in U.S. has increased productivity
- Political instability - Labor riots/strikes
- Exchange rate variables
- Risk of disruption from natural disasters
- U.S. \$ declining

- The [Reshoring Initiative](#) was founded by Harry Moser, former CEO of GF Agie Charmilles in 2010
- Goal: Change the Sourcing Mindset From “Offshored is Cheaper” to “Local Reduces the Total Cost of Ownership.”
- Train OEMs & Suppliers on why to source local and how to use TCO Calculator.
- Provides [Free](#) Total Cost of Ownership (TCO) Software for companies & suppliers/unions
- www.reshorennow.org

Sourcing Moving Home Slowly

- 61% of larger companies surveyed "are considering bringing manufacturing back to the U.S."
- 15.3% of U.S. companies stated that they are
- "definitively" planning to reshore activities to the U.S. Source: 2012 MIT FORUM FOR SUPPLY CHAIN INNOVATION REHORING STUDY
- 40% of contract manufacturers have done reshoring work this year
- Source: MFG.com 4/12

Reshoring /Offshoring are about in balance

Manufacturing Jobs / Year

	2003	2013	% Change
New offshoring *	~150,000*	30-50,000*	- 70%
New reshoring	2,000*	30-40,000**	+ 1,500 %

*Estimated / **Calculated

Reshoring's share of manufacturing job growth since Jan. 2010:

Job growth: $\approx 500,000$

Reshored jobs: $\approx 80,000$

Reshoring % of total: $\approx 15\%$

Major Companies Returning Manufacturing to U. S.

- Apple
- Caterpillar
- General Electric
- Whirlpool

Local Manufacturers that Reshored:

- EcoATm,
- Fluidmaster
- 451 Degrees
- Solatube

Solatube International



- Set up mfg. of Tubular Daylighting Devices in EPZ in China in 2008 - cheaper for 20 new plastic molding dies
- Moved mfg. back to their plant in Vista, CA at end of 2011

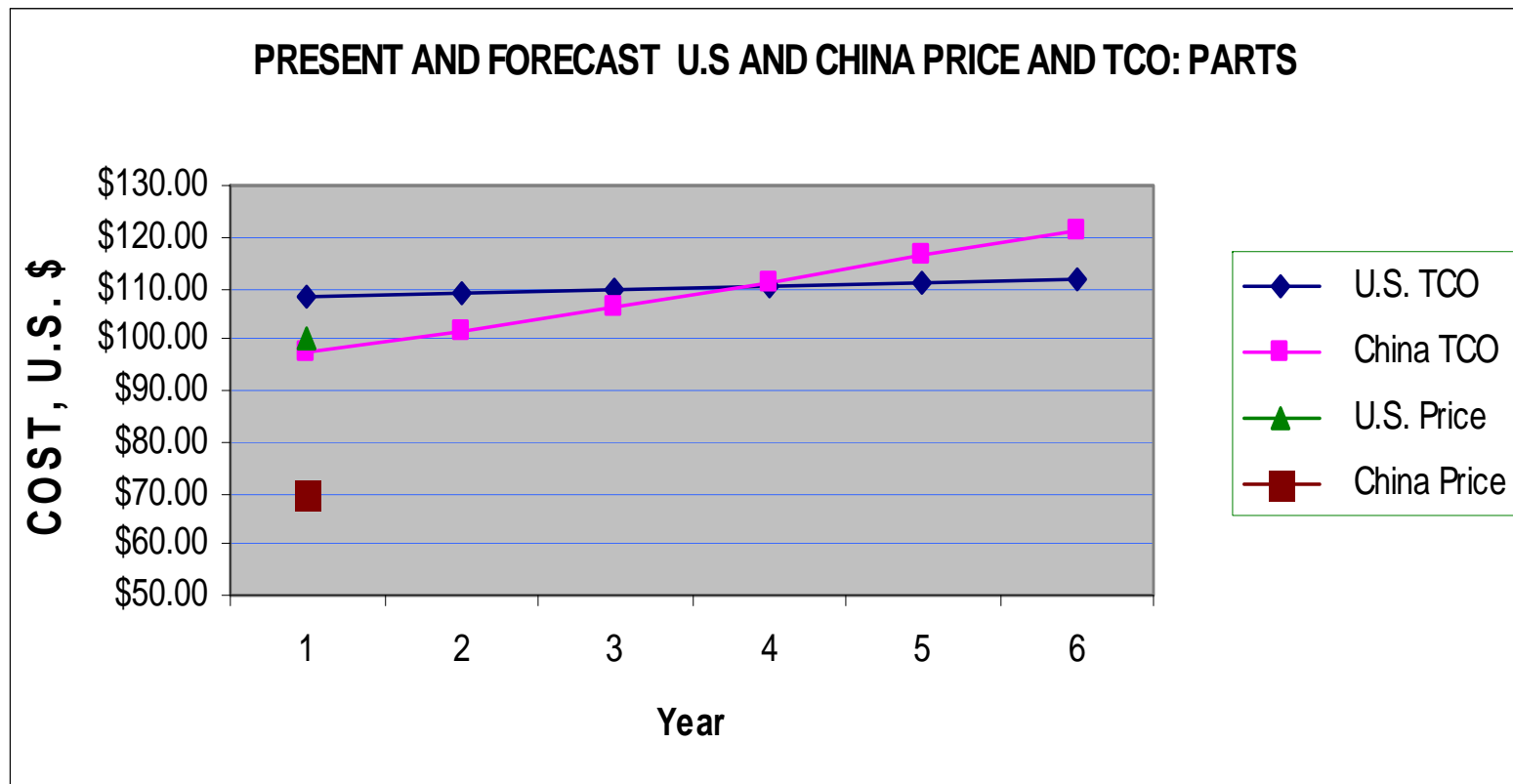
Reasons:

- Rising direct labor and indirect overhead costs
- Rising shipping costs
- Cost of quality problems
- More efficient in USA

TCO Estimator Benefits

- Provides a single TCO for each source
- Flexible: values are 100% user selected.
- Broad:
 - 29 cost factors.
 - Via pull down menus you automatically insert:
 - Freight rates for 17 countries
 - Duty rates for parts or tools, e.g. molds
 - Current value and 5 year forecast of TCO.
- Easy to use:
 - Explanations and references to help select values.
 - Instruction Manual.
- Free

TCO Comparison Example: a Moderate Labor Content Part



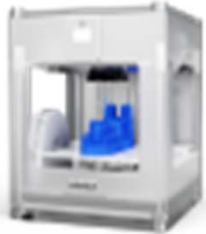
Advantages of Sourcing Domestically

- Ease of Communication
 - Same language
 - Same or close time zone
- Flexible Delivery
 - Rapid turnaround for tooling or prototypes
 - Just-in-time
 - Kan Ban
- Reliable Transportation
 - Many choices for ground transportation
 - Express or air freight available
- Smoother Design Changes
 - Easier to make changes understood
 - More willingness to make changes

- Lower Cost of Inventory
 - Lower minimum buys
 - Just-in-time delivery option
 - Kan Ban delivery Option
- Higher Quality
 - Materials match specifications
 - Consistent dimensional standards
- Lower Travel Expenses
 - Local/regional vendors within driving distance
 - Lower air fares for visiting domestic vendors
- No Intellectual Property Infringement
- Favorable Purchase Order and Credit Terms

- Offshore outsourcing will continue indefinitely
- Desirable" locations for outsourcing will change over time
- Purely financial benefits of lower cost will erode over time
- Challenge is to keep as much as possible within the United States
- Utilizing TCO estimator worksheet will help maintain and return manufacturing to America.

Additive Manufacturing



- Hailed by 'The Economist' as catalyst of 'the third industrial revolution'
- Projected to have a significant impact on manufacturing in the near future
- Has the potential to revolutionize the way we make almost everything
- Currently about 28% of the money spent on printing things is for final products
- Predicted to rise to 50% by 2016 and 80% by 2020



Additive Manufacturing Methods

- Stereolithography
- 3D printing
- Laser sintering
 - high powered laser fuses powdered metals into fully dense 3D objects, layer by layer
- Fused-deposition modeling
 - A plastic or metal wire is unwound from a coil, supplying material to an extrusion nozzle to form successive layers

Local Product Development Companies

A Squared Technologies

Clarity Design

DD Studio

D&K Engineering

Dynapac Design Group

Expertise Engineering

Fallbrook Engineering

Flex Partners

Leardon Solutions

Redpoint Engineering

- MakerPlace – think of it as your “dream” garage shop
- A place to use a variety of fabrication equipment & tools to work on projects: woodworking, metalworking, electronics, embroidery, sewing and specialty tools such as 3D printers, laser cutters and engravers.
- “Incubator” offices upstairs for businesses to operate out of the same building as the fab shop.

Training for Manufacturing Jobs



Today's manufacturing jobs requires a variety of skills
@ 10,000 Baby Boomers are retiring every day since 2011
Nationwide shortage of 600,000 skilled manufacturing workers

President Obama's Skills Certification System
NAM-Endorsed Manufacturing Skills Certification System

Society of Manufacturing Engineers (SME)

Manufacturing Skills Training thru ToolingU

Career Technical Training Options

- San Diego Community College
- SDCCCD Continuing Education Center
- Miramar College
- MiraCosta College
- San Pasqual High School
- Chaparell High School (Charter)
- Quality Controlled Manufacturing Inc.
- Workshops for Warriors (non-profit)

Licensing vs. Starting Company

- San Diego Inventors Forum
 - 70% of inventors in last two years plan to license their technology vs. start a company
- CONNECT Springboard
 - No change in demand, but change in composition
 - Technology, biotech/biomed and life science
- UCSD Jacobs School of Engineering von Liebig Entrepreneurism Center
 - Currently 30 teams that want to start company

2014 Outlook

●Positives:

- Reshoring is creating more manufacturing jobs and generating more regional GDP
- Additive manufacturing is accelerating development of new products
- Broad access to skills training available in San Diego

●Negatives:

- Unknown economic impact of Obamacare
- Possibility of full sequestration being restored

Michele Nash-Hoff is available for speaking and consulting on when and how to return manufacturing to America.

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