

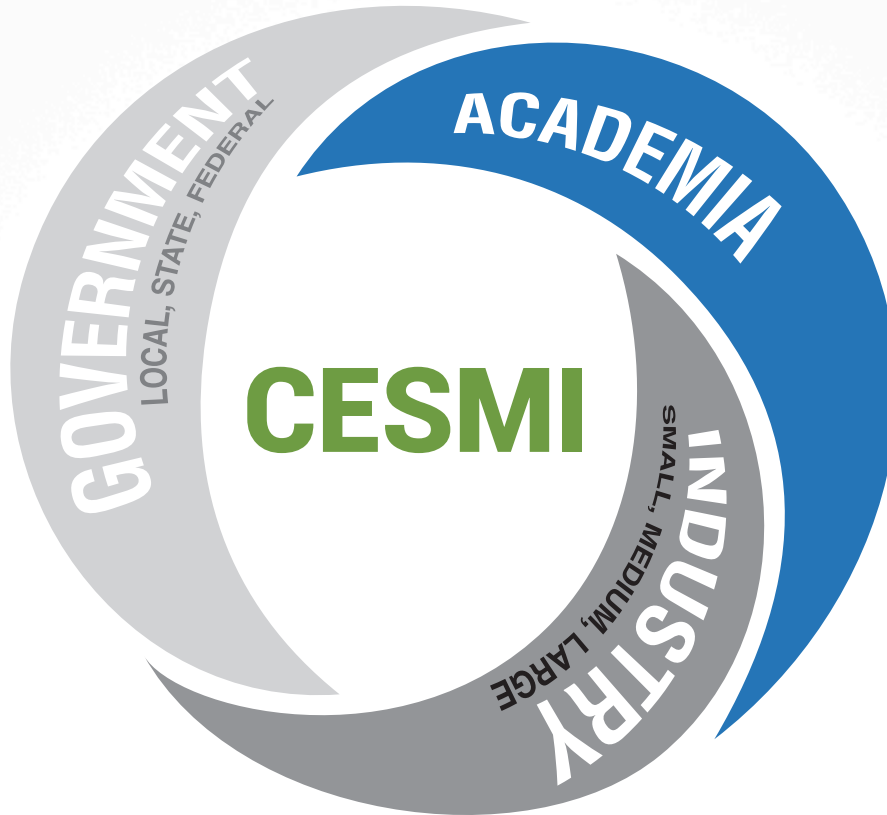


A Clean Energy
Smart Manufacturing Innovation Institute
Rich Hoffman



SMLC

SMART MANUFACTURING LEADERSHIP COALITION



DOE \$70 Million in Matched Funding

Potential \$210M+ Institute

CLEAN ENERGY SMART MANUFACTURING INSTITUTE

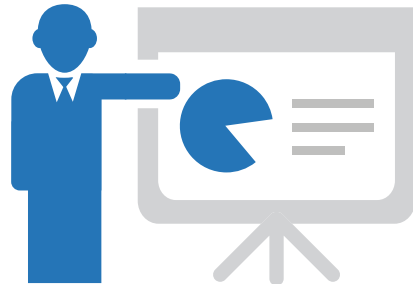
The Funding Opportunity

Bringing together a collaboration

A network of talent, expertise, resources & programs around the next industrial revolution: Smart Manufacturing to transform manufacturing.



Accelerated
R&D



Workforce & Education
Development

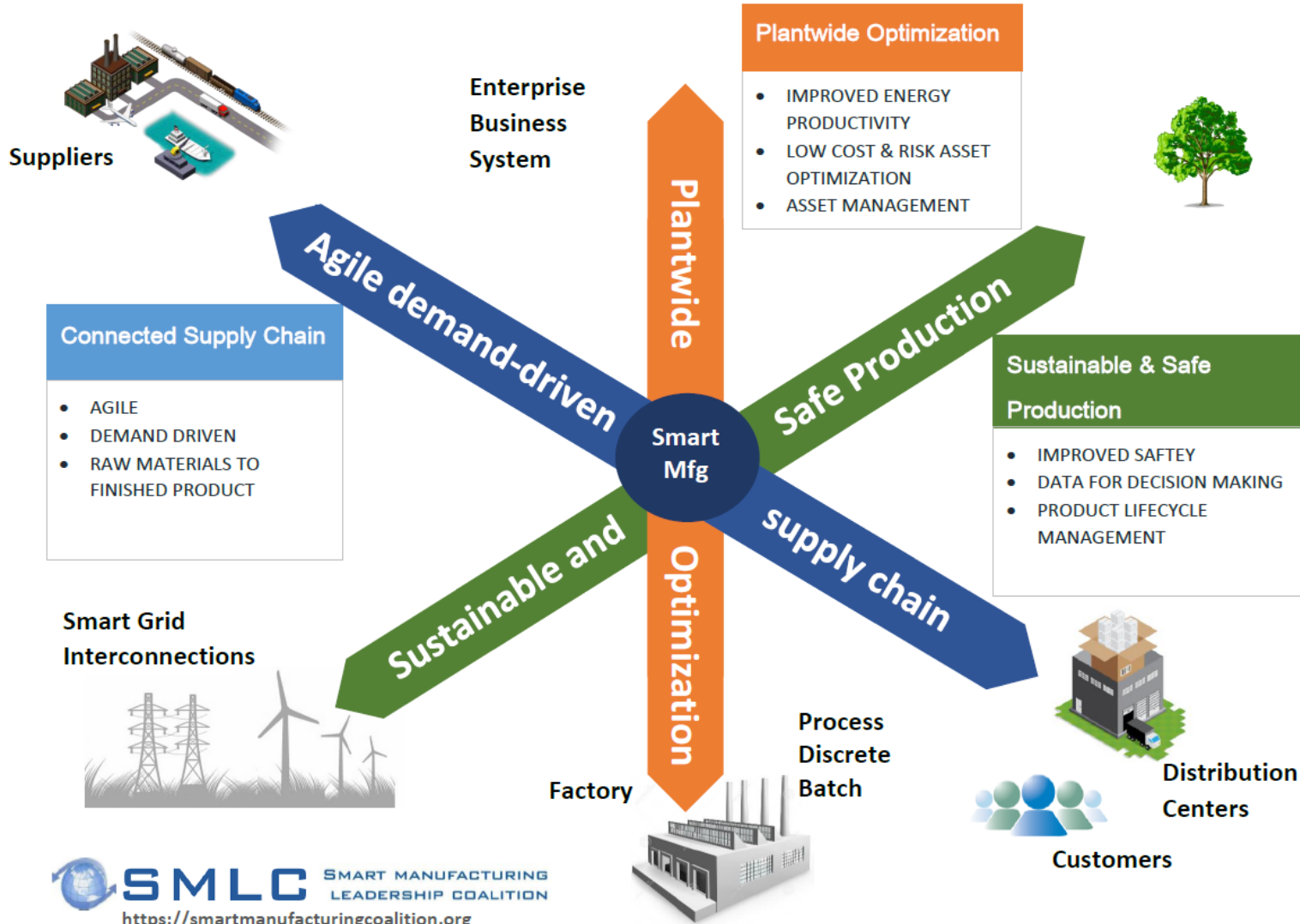


Access to New
Technology



Clean Energy
Objectives

Building Infrastructure Powering Smart Decisions






An SMLC-led Institute Delivers:

Insight

Control

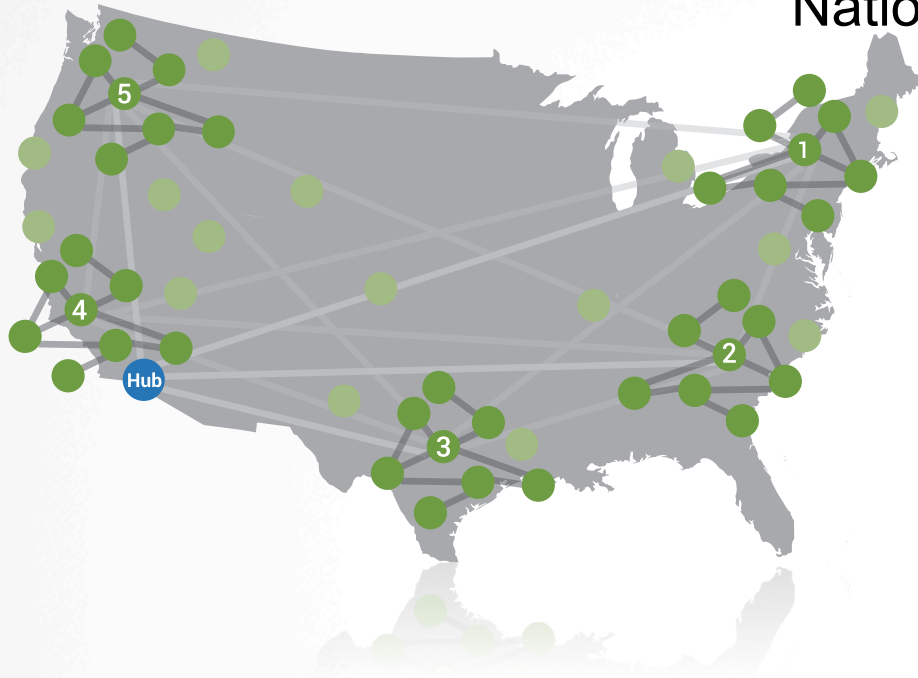
Efficiency

Access

- Overall Energy Efficiency  15%
- Energy Productivity  50%
- Implementation costs  25%-80%
- Safer work environments
- Less waste

Interlinked Regional Centers

National Impact



A Network of Networks Approach

- Universally accessible
- Achieves local & collective objectives
- Leverages unique industrial environments, talent, expertise, existing programs & facilities
- National industry-driven workforce & education development strategy
- Accelerated R&D & industry learning

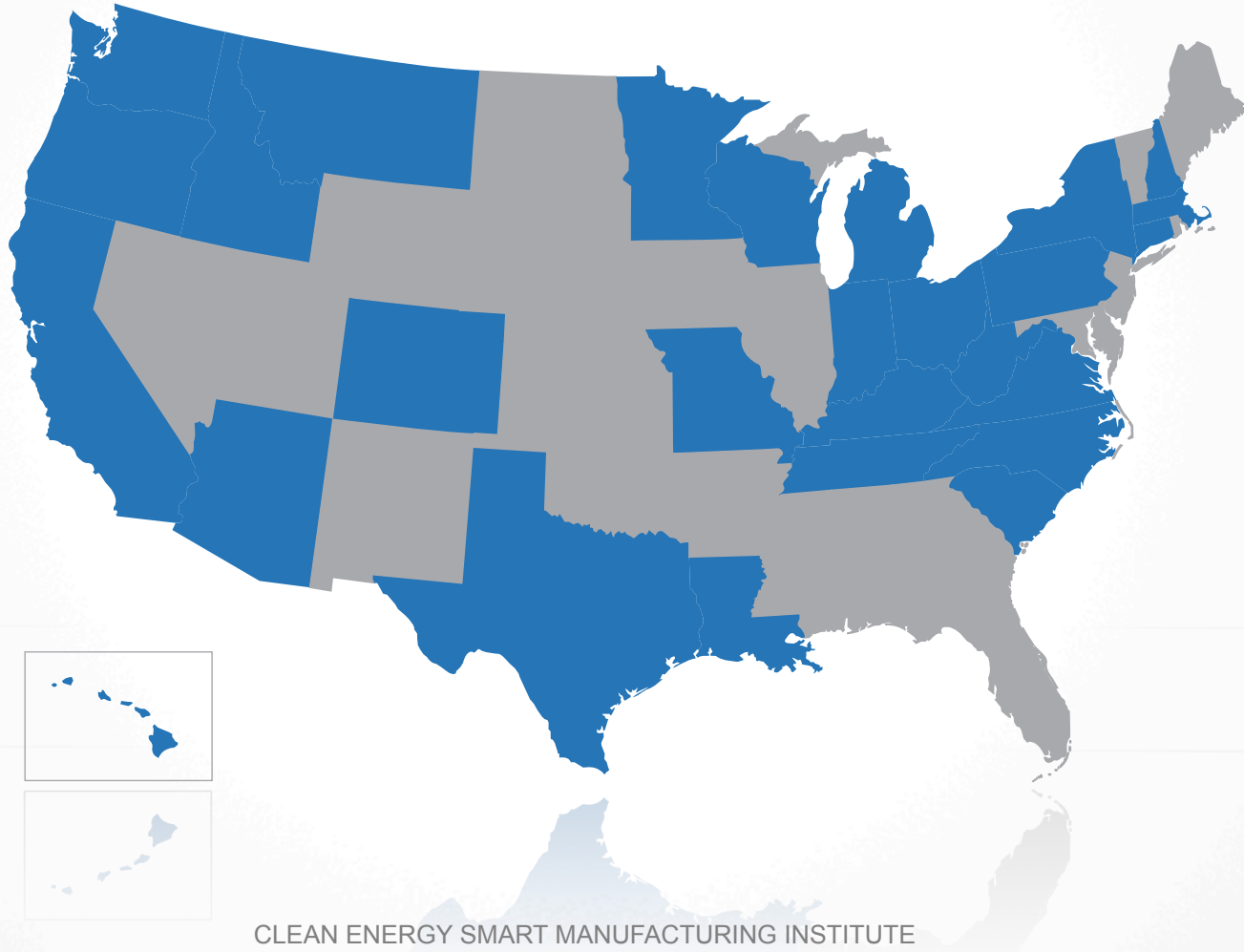
**Headquarters based in
Los Angeles, CA**

Five Regional Centers

1. North East (NY)
2. South East (SC)
3. Gulf Coast (TX)
4. California (CA)
5. Pacific North West (WA)

Strength of Institute Collaboration

We represent 28 states, leveraging existing organizations including 100+ Institutions & Industry Partners & 150+ Facilities



Headquartered in Los Angeles, CA

- **California is #1 in the U.S.** for manufacturing employment - **1.3M jobs**
- Manufacturing employment in **SoCal** is in **excess of 800,000 jobs** at more than 26,000 establishments
- **Largest manufacturing base in the U.S.**
- **Diversity of industry segments & 40,000 small and medium manufacturers (SMM)** that make up a **clean energy value chain**
- **SMMs are suppliers** to original equipment manufacturers and Top-Tiers throughout the U.S
- **Clean Energy is a top priority** for CA Governor Jerry Brown and LA Mayor Eric Garcetti
- Ports & transportation systems **bring in & distribute 1/2 of all US annual imports**
- **Multinational IT firms** at forefront of next gen data-driven manufacturing infrastructure
- **Epicenter of the venture capital industry,** commercializing disruptive technologies

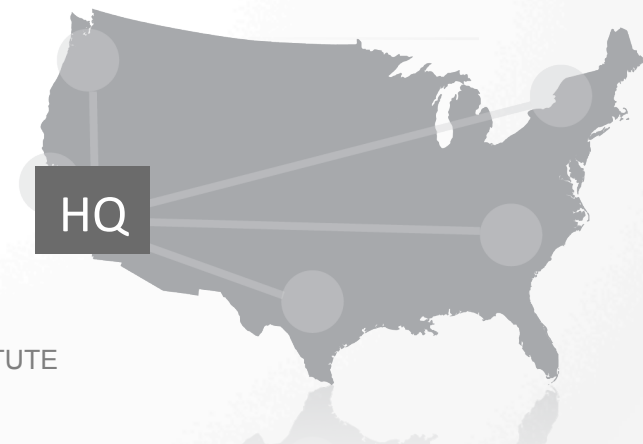


Economic Impact for CA

California's Manufacturing Output = \$230B (2011).

A modest estimate - a 10 % increase in output or productivity would result in:

- +\$23B annual revenue
- + 100,000 high-paid jobs (\$100K average)
- + 150,000 other jobs (average \$50K).
- + new start-up industry of \$500M (over 4-6 years)
- + \$32B to California economy due to 1:1.4 multiplier effect (e.g., jobs creation)



Environmental Impact for CA



National Impacts:

- Energy Productivity up by 50%
- Implementation cost reduced by 25%-80%
- Safer work environments
- Less waste
- **10-20%** cost reduction of production by optimizing energy use, productivity & efficiencies
- **20-30%** reduction in energy consumption/greenhouse gas emissions
- **\$7B-25B/year** energy cost savings
- **20-50%** reduction in supply chain energy stream use

Next Steps

Get Involved

Join the SMLC and over 100 expected partners taking part in this historic opportunity.

- **Plan:** Consider how your organization will benefit from involvement
- **Support:** Write a non-binding letter in support of this effort
- **Pledge:** Support this proposal through a contribution to help meet and exceed the required DoE cost-share

Let SMLC help you build a better business. Become a part of the Smart Manufacturing community today.

Extra Slides



DOD Funded:

America Makes

3D Printing / Additive Manufacturing
Youngstown, OH

DMDII

Digital Manufacturing & Design
Chicago, IL

LIFT

Lightweight Metals
Detroit, MI

AIM Photonics

Photonics
Rochester, NY

FLEXTECH Alliance

Flexible Hybrid Electronics
San Jose, CA

Unawarded Institutes:

Revolutionary Fibers & Textiles

DOE Funded:

Power America

Wide Bandgap Semiconductors
Raleigh, NC

IACMI

Composites
Knoxville, TN

Unawarded Institutes:

Smart Manufacturing

The NNMI

A National Network of Institutes focused on advanced manufacturing technologies

National Revolution

To ensure the success of the Institute, the DoE has comprehensively outlined criteria to win the grant. The winning Institute needs:

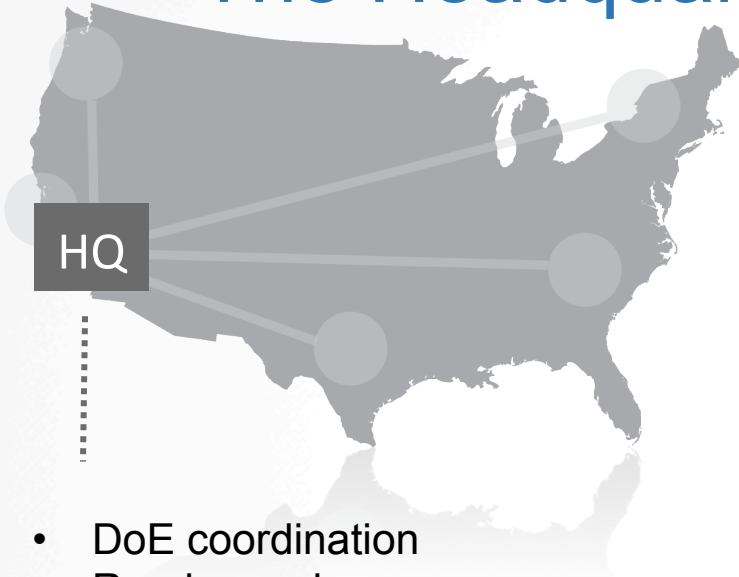
DoE Requires

- Broad-based membership
- Focus on MRLs 3-7
- 50% reduction in time and cost to develop and deploy smart manufacturing technologies
- Strong outreach, training, and workforce development programs
- Extensive road-mapping to ensure goals are transparent, achievable, and accountable to both the DoE and Institute partners

SMLC Delivers

- **All DoE requirements**
- Regional Membership
- Open-platform toolkit marketplace
- Technological Innovation
- Modular adoption of technology
- Economy-of-scale cost benefits to R&D and implementation

The Headquarters – Los Angeles, CA



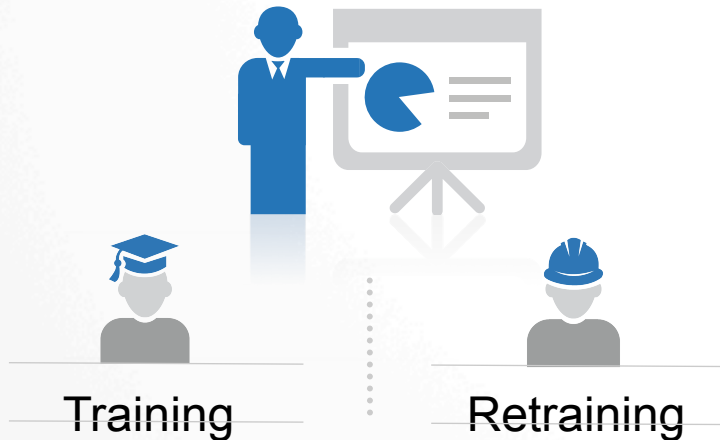
- DoE coordination
- Road mapping
- Supervises regional centers
- Distributes Funds
- Platform & Marketplace

- Aligned with State policy goals for GHG mitigation efforts
- help CA achieve AB32-related goals (offer incentive grants to GHG reduction projects)
- Matching grants to companies that successfully raise money from venture capital firms for technologies that come out of the institute.
- California manufacturing competitiveness by changing the energy-related cost structure of the state and on California manufacturing employment.
- catalyze industry to make broad systemic changes to the way we use energy to design and make what we consume

Education & Workforce Development

leverage public-private programs & initiatives in critical mass

World Class Academic & Research Institutions, National Labs, Economic Development & Business Associations



Develop coordinated strategy:

- technical assistance in tech adoption
- cutting edge education & workforce training for high skilled occupations
- new education curriculum, certification programs
- industry-university partnerships

Results:

- enable innovation
- secure an underrepresented & diverse talent pipeline
- improve business climate
- advance industry-driven, multi-disciplinary cross sector collaboration

Industry Impact

Easy, Affordable, Low-Risk Access

- **Demand-driven** efficient use of resources and supplies in more highly optimized plants and supply chains
 - 25% reduction in safety incidents
 - 25% energy efficiency improvement
 - 10% overall operating efficiency improvement
 - 40% reduction in cycle times
 - 40% reduction in water usage
- **Product safety**
 - Tracking & traceability throughout the supply chain
- **Sustainable production** processes for current and future critical industries
 - 10x improvement in time to market in target industries
 - 25% reduction in consumer packaging
- **Maintain and grow** existing U.S. industrial base
 - Environment for broad innovation
 - 25% revenue in adjacent industries
 - 25% revenue in new products & services
 - 2x current SME' s addressing total market
 - More highly skilled sustainable jobs

Current SMLC Membership

American Council for an Energy Efficient Economy (ACEEE)	General Electric	Rockwell Automation
AMP Socal	General Mills	Rutgers University
Alcoa	General Motors	Savannah Rivers National Lab
American Institute of Chemical Engineers (AIChE)	Manufacturing Enterprise Solutions Association (MESA)	Savigent Software
American Society of Quality	MIT	Schneider Electric
ARC	MT Connect	SME
Association of State Energy Research and Technology Transfer Institutions (ASERTTI)	National Association of State Energy Officials (NASEO)	Southwest Research Institute - SWRI
Carnegie Mellon	North Carolina State University	Sustainable Solutions
Connecticut Center for Advanced Technology (CCAT)	Nimbis Services	Texas A&M Engineering Experiment Station (TEES - TAMU)
Corning	NIST	Tulane – PolyRMC
Department of Energy (DOE)	NSF	United Technology Research Center (UTRC)
Emerson	OSISoft	UC Berkeley
Electric Power Research Institute	Owens Corning	UC Irvine
	Pacific Northwest National Laboratory	UCLA
	Pfizer Inc.	USC - EDC
	Praxair	UT Austin
	Purdue University	West Virginia University
	RPI	