

MANUFACTURING USA INSTITUTES:

SESSION I: WORKFORCE DEVELOPMENT STRATEGIES



MAY 16, 2017

Webinar will begin at 2:00 pm ET

[Click here to watch the webinar recording](#)



WEBINAR DETAILS

For this webinar you will be in listen only mode. You can ask questions via the chat window. This webinar will be recorded.

Brought To You By:

Florida Advanced Technological Education Center for Manufacturing (FLATE)

NSF ATE Centers network

With Additional Support by the ATE Collaborative Impact Project

Disclaimer: This material is based upon work supported by the National Science Foundation under Grants # 1204751. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



POLL #1



POLL #2



TODAY'S PRESENTERS



Marilyn Barger

Presenter
PI and Executive Director;
Florida Advanced
Technological Education
Center (FLATE)



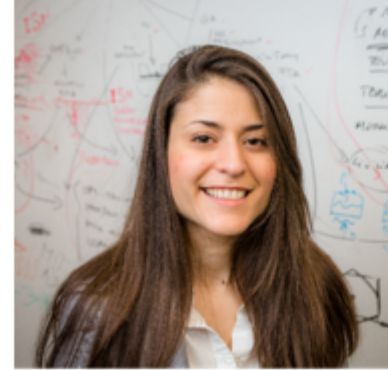
Celeste Carter

Presenter
Program Director, NSF
Advanced Technological
Education (ATE)



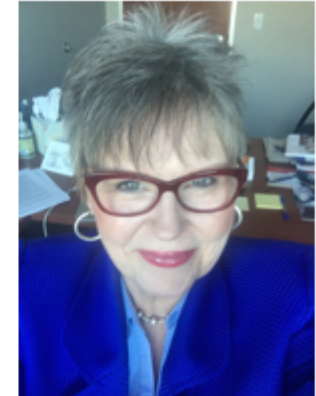
Brynt Parmeter

Presenter
Director of Education and
Workforce Development
NEXTFLEX



Noah Droir

Presenter
Director of Education and
Workforce Development,
AFFOA



Pam Carpenter

Presenter
Director Workforce and
Education POWER
AMERICA

Mike Lesiecki
Moderator
Principal Investigator (PI); MATEC
Maricopa Community Colleges



TODAY'S TOPICS

Manufacturing USA Institute Background

Brief Overviews from 3 Manufacturing USA Institutes

- About the technology
- Workforce initiatives
- Focus on 2-year technicians



MANUFACTURING USA INSTITUTES OVERVIEW

- President's Council of Advisors on Science and Technology
- Create a collaborative space for industry and academia to solve problems
- Address lowering the pre-competitive expenses of applied R&D
- Lower the risk of new technologies and materials for U.S. manufacturing
- Revitalized American Manufacturing & Innovation (RAMI) Act 2014



MANUFACTURING USA INSTITUTES OVERVIEW

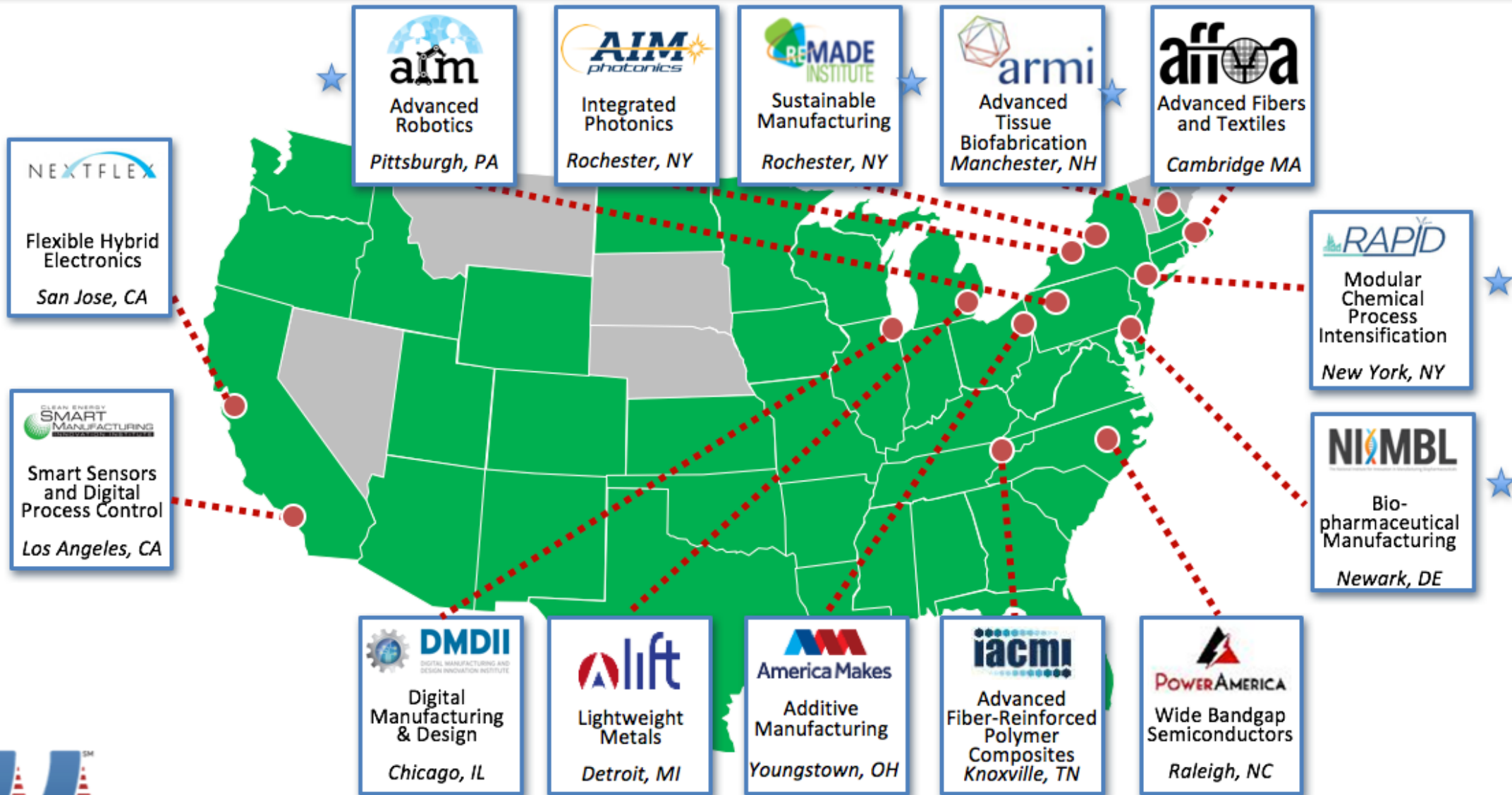
STRATEGIC GOALS

- Increase competitiveness of U.S. manufacturing
- Facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing domestic manufacturing capabilities
- **Accelerate the development of an advanced manufacturing workforce**
- Support business models that help the institutes become stable and sustainable.

<https://www.manufacturing.gov/files/2016/02/2015-NNMI-Strategic-Plan.pdf>



Manufacturing USA Today



Shaded states have major participants in Manufacturing USA Institutes

★ Remaining Institutes Where MEP is not yet Embedded



NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

MANUFACTURING USA INSTITUTES OVERVIEW

INSTITUTE NETWORK (status April 2017)

- 14 institutes launched - \$1 billion federal investment matched by over \$2 billion non-federal
- Multi-agency funding and support
- 8 active institutes: 1,300 members, over 240 technology development projects.
 - Members include 2/3 of Fortune 500 U.S. manufacturers
 - 8 out of the 10 top-ranked research / engineering universities



MANUFACTURING USA INSTITUTES OVERVIEW

KEY FINDINGS (2017 3rd Party Review/Assessment)

- Manufacturing USA Spurs R&D Innovation
- The Program is a highly effective ecosystem convener
- Institutes are:
 - demonstrating the ability to deliver 5x leveraged value for members
 - successfully planning for sustainability independent of U.S. government influence



NSF ATE

NSF DUE Advanced Technological Education Program



Dr. Celeste Carter
ATE Program Director



Scientific and Advanced Technology Act of 1992

“To establish a national advanced technician training program, utilizing the resources of the Nation’s two-year associate-degree-granting colleges to expand the pool of skilled technicians in strategic advanced-technology fields, to increase the productivity of the nation’s industries, and to improve the competitiveness of the United States in international trade, and for other purposes.”

Advanced Technological Education (ATE) Program

- **Education** of science and engineering **technicians** for advanced-technology fields that drive the nation's economy.
- **Community and Technical Colleges** in leadership roles
- **Partnerships:** Industry, Economic Development Agencies, Secondary schools, 4-yr Institutions
- **Pathways:** 7-12, 2- and 4-yr



Lessons Learned: Education & Industry Partnerships

- **Industry**
 - Hire adjunct faculty from industry
 - Skill standards
 - Industry Advisory Board
 - Mentors
- **Pathways**
 - Stackable credentials/industry certifications
 - Transitions aligned
 - Problem/Project/Case-based learning (Hands On-Minds On)
- **Integrated work experiences**
 - Contract Research Organizations, Contract Manufacturing Organizations, Internships, Apprenticeships



NSF 16-007: Dear Colleague Letter

- Describes an opportunity for the ATE community to work with Manufacturing USA Institutes and IMCPs.
- Current ATE awardees may request supplemental funds to complete an agreed upon scope of work for an Institute or IMCP related to technician education.
- Regular ATE project proposals that include partnerships of 2-year colleges with the Manufacturing USA Institutes can also be submitted at the regular submission dates.

MANUFACTURING USA INSTITUTES

QUESTIONS?



NEXTFLEX

Flexible Hybrid Electronics Manufacturing Innovation Institute



Brynt Parmeter

Director of Education and Workforce

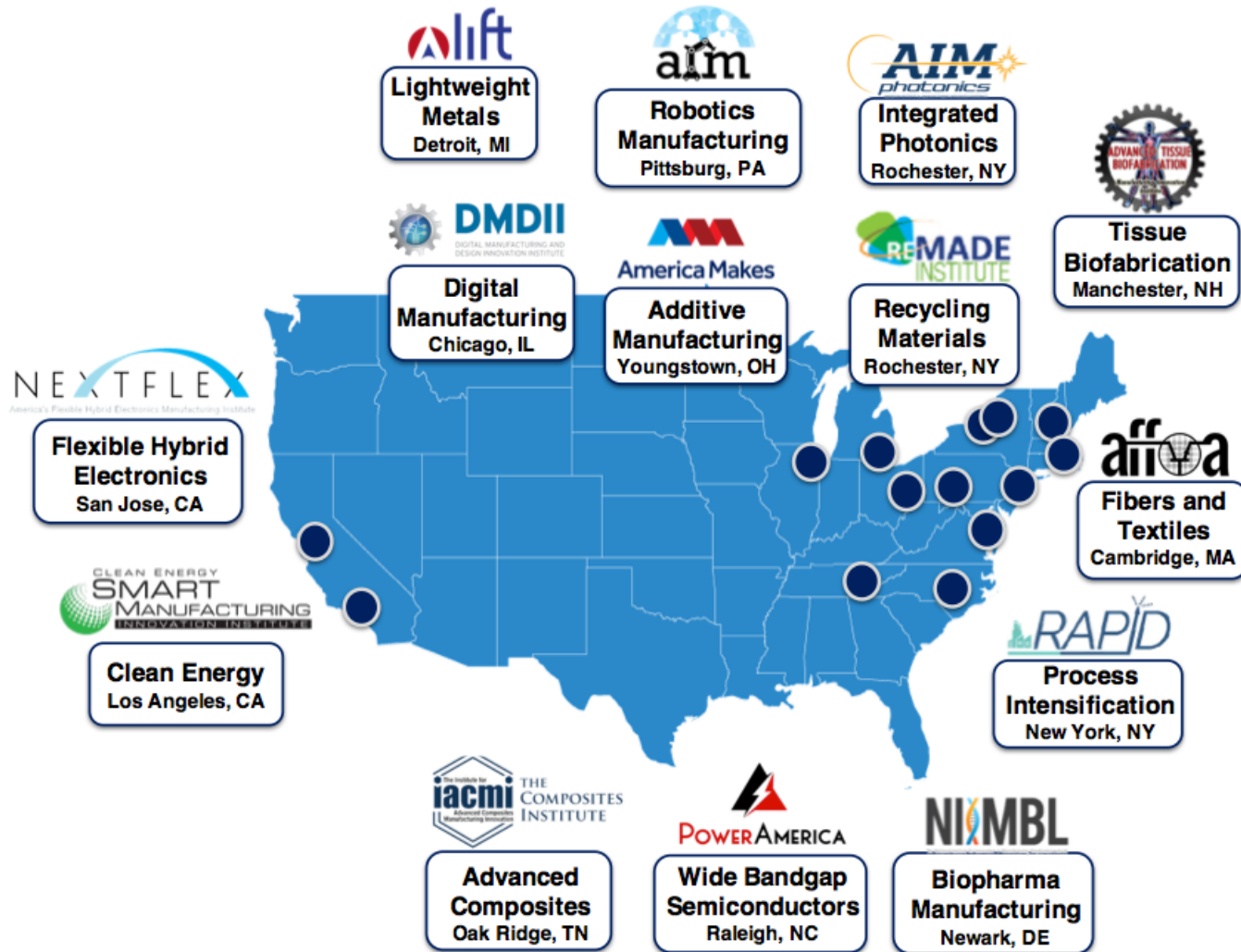


The Future of Advanced Manufacturing

Brynt Parmeter



A National Network for Manufacturing Innovation

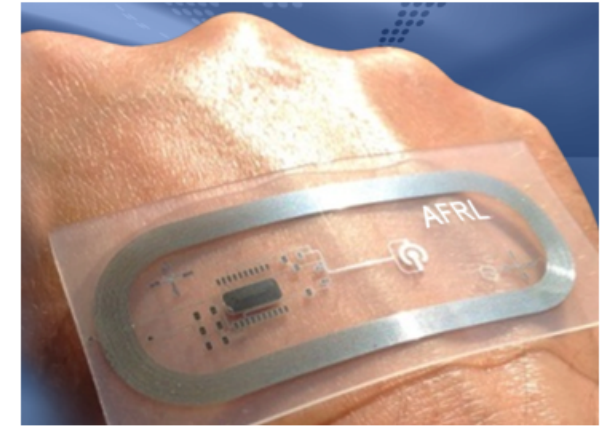
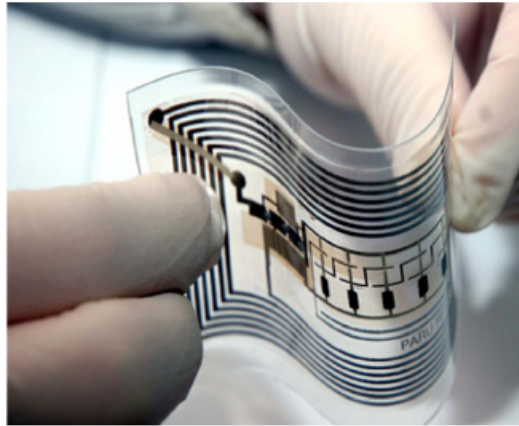


A network of regional institutes, each with a specialized technology focus.

Secure the future of manufacturing in the U.S. through innovation, collaboration and education.

- 14 institutes sponsored by Departments of Defense, Energy, and Commerce
- Over \$1 billion Federal funding matched by over \$2 billion non-Federal funding
- Over 1,300 public / private sector partners
- Represented in 40+ states

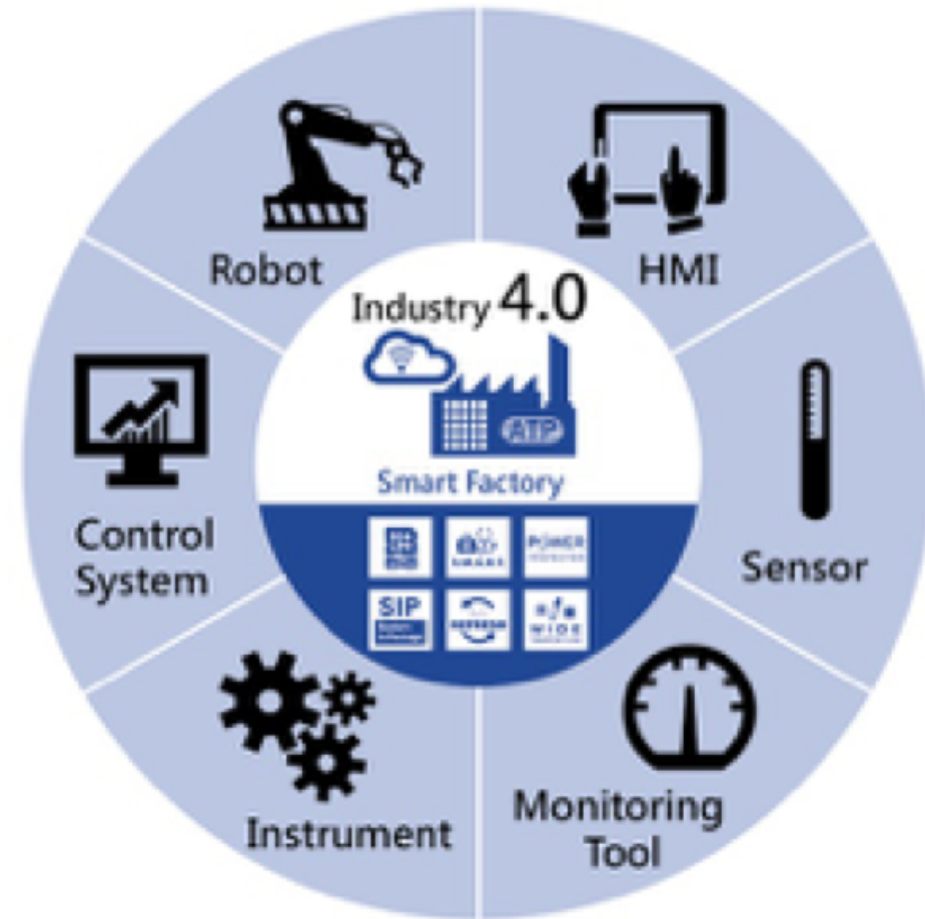
The flexibility and low cost of printed electronics on flexible substrates combined with the performance of Semiconductor devices to create a new category of electronics



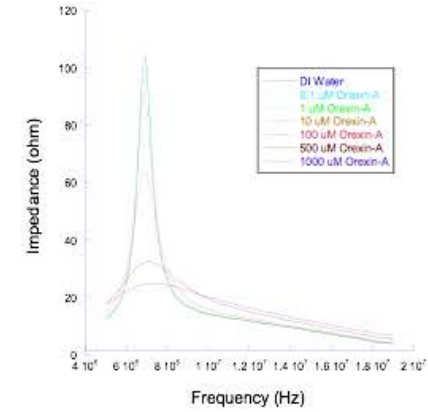
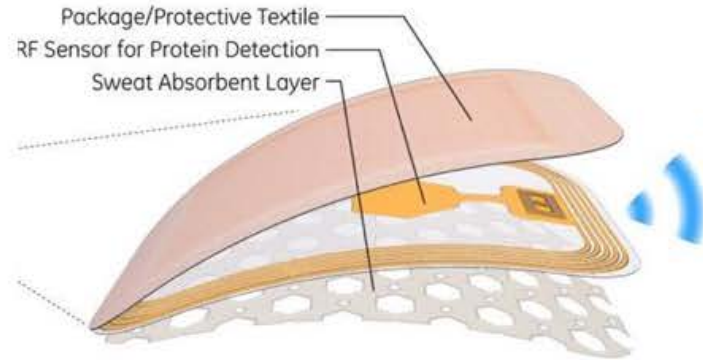
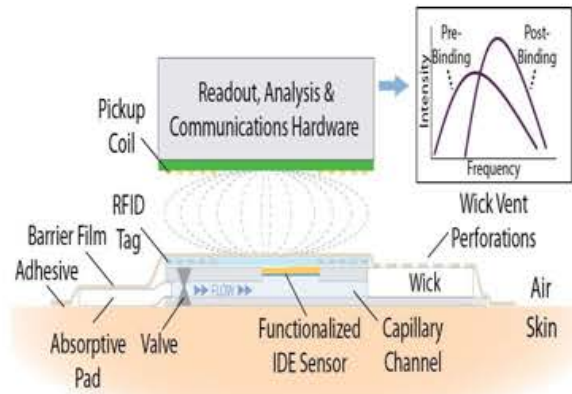
The world is not two dimensional
Electronics today are rigid and obtrusive
Customization of electronics for everything

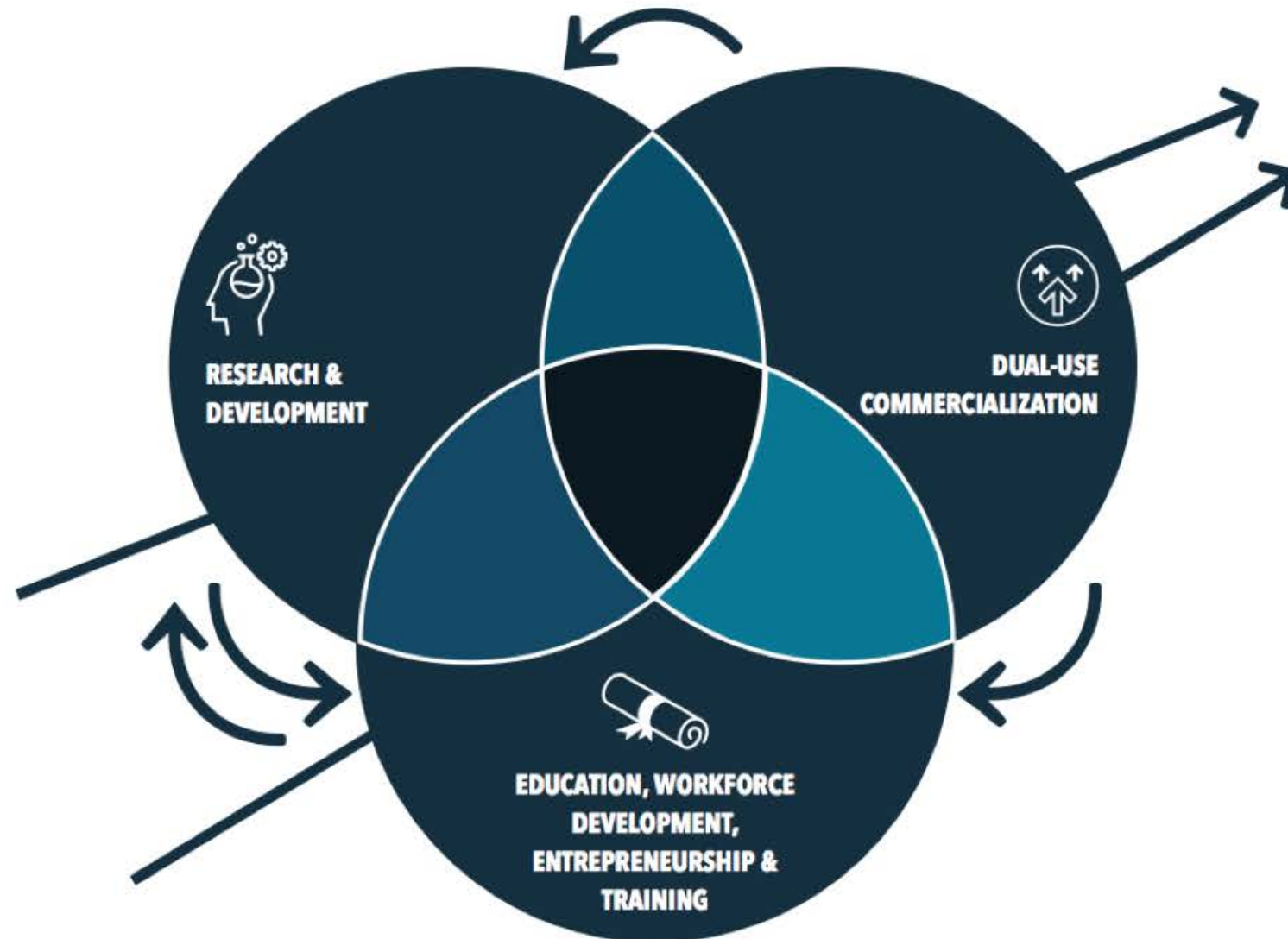
Shaped and formed electronics

- Human health and performance
- Asset and structural reliability
- Process tracking
- Soft robotics
- Sensing technologies

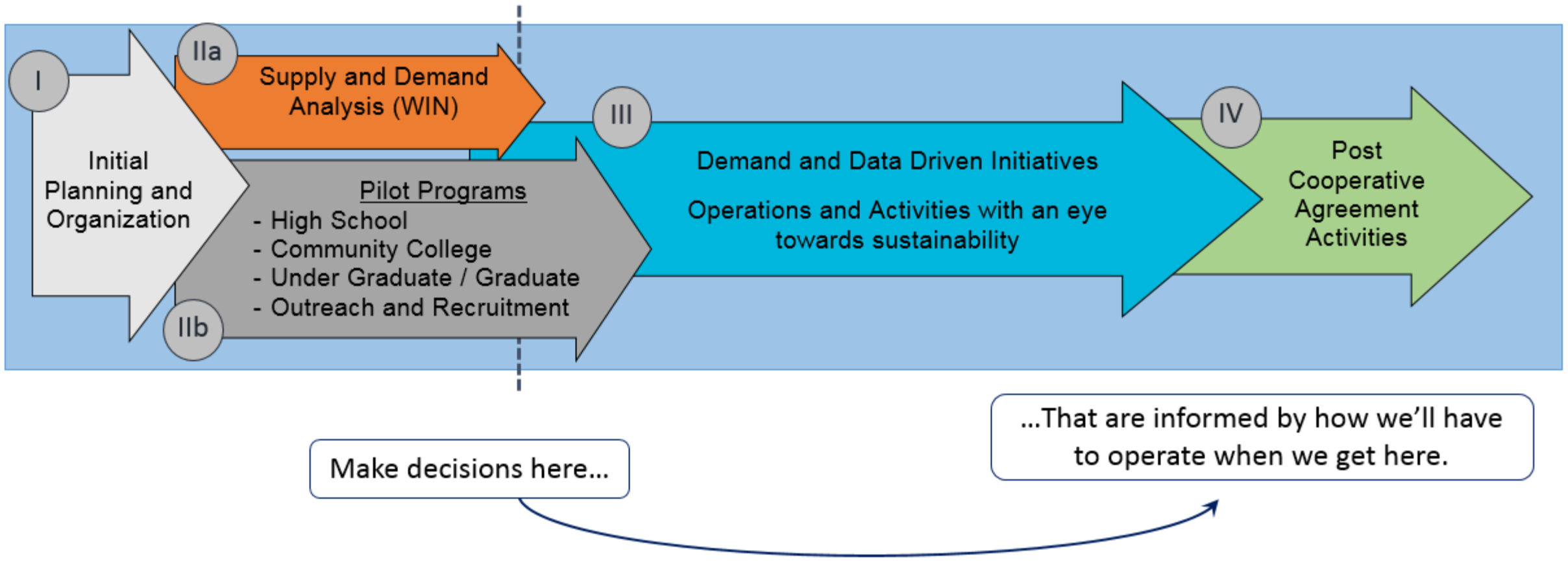


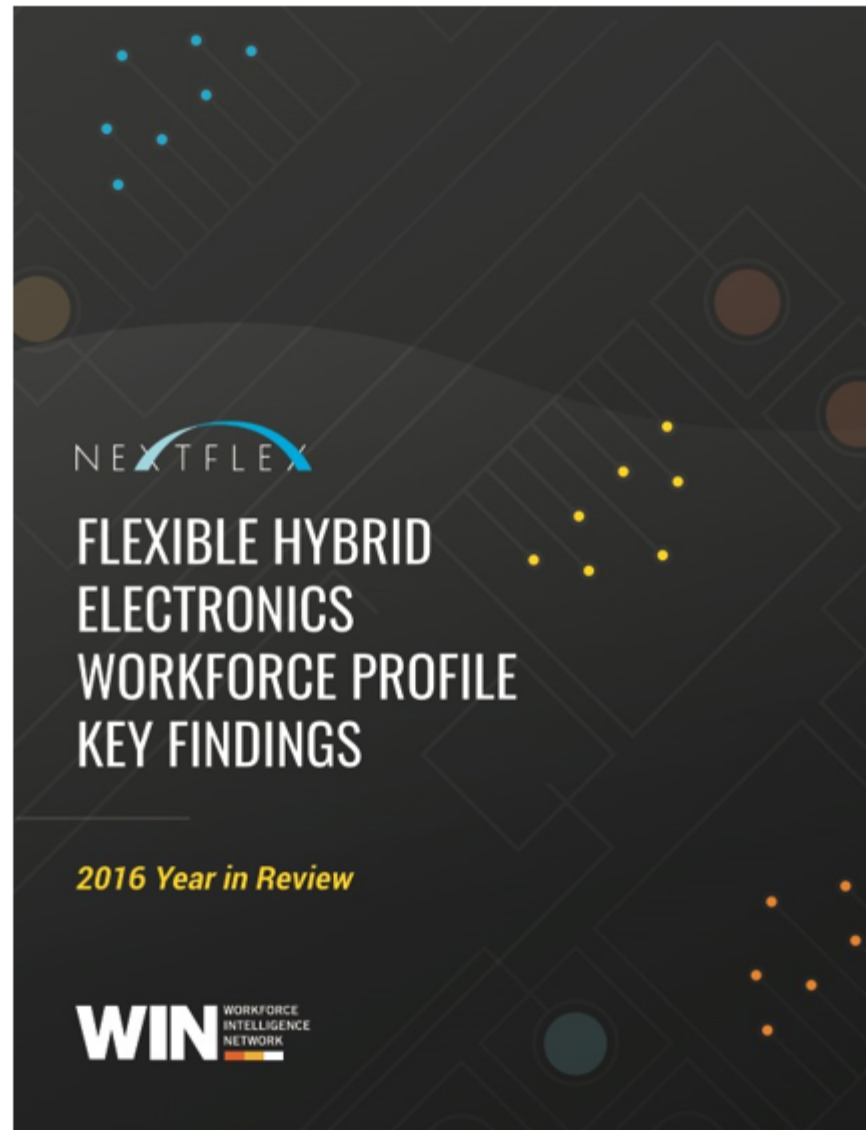
Dual Use Technology





Develop sustainable programs that facilitate and enable the creation of the talent needed by our industry partners.





60 occupations

9,628,062 US workers in 2016

1,442,606 job postings in 2016

\$55,883 average annual salary

22% women

25% are over 55 years old

6% under 24 years old

But...what about the wave that's coming?

Tremors and ripples

Robot Prices:

- ✓ drop 30% in 2-3 years

Robotic Manufacturing Tasks:

- ✓ 10% now – 45% in 2025

A.I. will accelerate this process:

- ✓ 50 billion connected devices

The wave that's coming

1000x the amount of robotic machines in 5 years compared to today

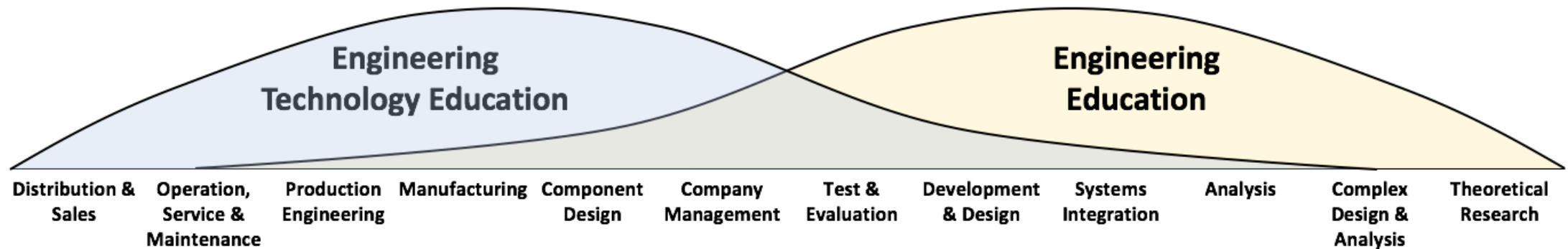
Corresponding demand increase for the people doing related work

Design, Manufacture, Install, Operate,
Program, Maintain, Synchronize



*Let's teach people how to ride and survive this wave...
Or, they will get crushed by it in the future*

This will benefit all sectors: Manufacturing, Medical, Transportation, Logistics, Agriculture, Energy, Education...



Engineering Technologist and Technician Job Description

*“The roles of Engineering Technicians involve them in the Implementation of proven techniques and procedures to the solution of practical problems. They carry a measure of supervisory and technical responsibility and are competent to exercise creative aptitudes and skills within defined fields of technology, initially under the guidance of engineering practitioners with appropriate experience. **Engineering Technicians contribute to the design, development, manufacture, commissioning, operation, and maintenance of products, equipment, processes, and services.**”*

International Engineering Alliance

NextFlex Primary Occupations

Workers related to flexible hybrid electronics (FHE) have diverse backgrounds and training. Because FHE combines traditional manufacturing technologies, like printing and circuit building, with emerging technologies, including sensors and flexible materials and substrates, workers skilled in FHE are hard to find. NextFlex is working with the Workforce Intelligence Network to develop a list of current occupations that relate to FHE at the primary and secondary level. This document provides a list of those occupations.

- Aerospace Engineering and Operations Technicians
- Aerospace Engineers
- Assemblers and Fabricators, All Other
- Biochemical Engineers
- Biochemists and Biophysicists
- Bioinformatics Scientists
- Bioinformatics Technicians
- Biomedical Engineers
- Chemical Engineers
- Chemical Technicians
- Chemists
- Civil Engineers
- Computer Hardware Engineers
- Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic
- Computer Programmers
- Computer-Controlled Machine Tool Operators, Metal and Plastic
- Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
- Electrical and Electronics Drafters
- Electrical and Electronic Engineering Technicians
- Electrical and Electronic Equipment Assemblers
- Electrical and Electronics Installers and Repairers, Transportation Equipment
- Electrical Engineering Technicians
- Electrical Engineering Technologists
- Electrical Engineers
- Electromechanical Engineering Technicians
- Electromechanical Equipment Assemblers
- Electro-Mechanical Technicians
- Electronic Drafters
- Electronics Engineering Technicians
- Electronics Engineering Technologists
- Electronics Engineers, Except Computer
- Engineers, All Other
- First-Line Supervisors of Production and Operating Workers
- Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
- Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
- Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
- Industrial Production Managers
- Layout Workers, Metal and Plastic
- Logistics Managers
- Machinists
- Maintenance and Repair Workers, General
- Maintenance Workers, Machinery
- Manufacturing Engineering Technologists
- Manufacturing Engineers
- Manufacturing Production Technicians
- Materials Engineers
- Materials Scientists
- Mechanical Engineering Technicians
- Mechanical Engineering Technologists
- Mechanical Engineers
- Mechatronics Engineers
- Microsystems Engineers
- Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
- Model Makers, Metal and Plastic
- Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
- Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
- Nanosystems Engineers
- Nanotechnology Engineering Technicians
- Nanotechnology Engineering Technologists
- Non-Destructive Testing Specialists
- Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic
- Prepress Technicians and Workers
- Printing Press Operators
- Product Safety Engineers
- Production Workers, All Other
- Production, Planning, and Expediting Clerks
- Quality Control Analysts
- Quality Control Systems Managers
- Radio Frequency Identification Device Specialists
- Robotics Engineers
- Robotics Technicians
- Rolling Machine Setters, Operators, and Tenders, Metal and Plastic
- Software Developers, Systems Software
- Software Quality Assurance Engineers and Testers
- Supply Chain Managers
- Team Assemblers
- Welding Engineers

How do we get young people interested in these types of jobs and on the pathways to fill them in the future?

- Assemblers and Fabricators
- Supply Chain Managers
- Electromechanical Equipment Assemblers
- Computer Programmers
- Printing Press Operators
- Logistics Managers
- Product Safety Engineers
- Robotics Technicians
- Electronics Engineering Technicians
- Industrial Production Managers
- Computer Programmers
- Model Makers, Metal and Plastic
- Nanotechnology Engineering Technicians
- Chemical Technicians
- Mechanical Engineering Technicians
- Maintenance and Repair Workers
- Electronic Drafters
- Aerospace Engineering and Operations Technicians
- Machinists
- Radio Frequency Identification Device Specialists

Connecting the pieces to grow the future of advanced manufacturing



High School



Community College



Industry



State Government



Local Government

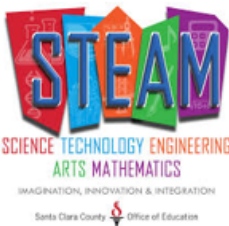


Non-Profits

K – 12 Schools



Santa Clara County
Office of Education



College / University



Industry

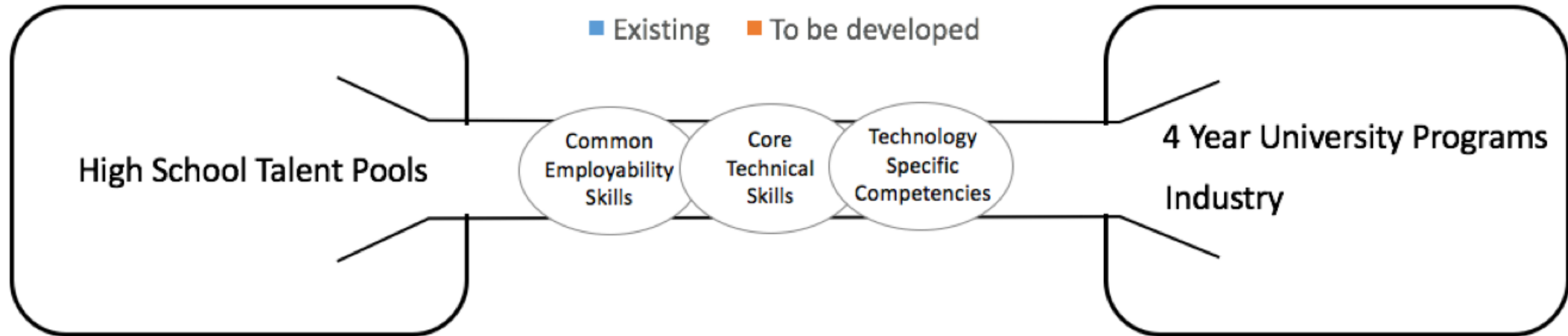


Government and Non-Profit





■ Existing ■ To be developed

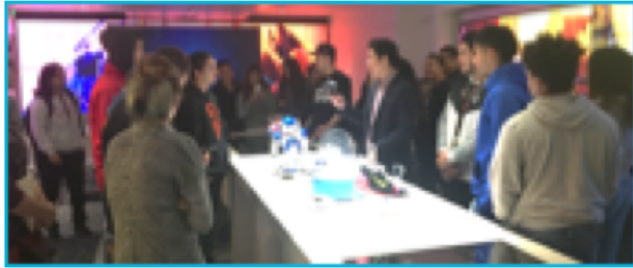


- ✓ Attract
- ✓ Recruit
- ✓ Enroll

- Industrial Automation
- Program and Deploy IOT Device(s)
- Smart Manufacturing and Processes

- ✓ Degree completion
- ✓ Employment Readiness
- ✓ Mentoring
- ✓ Internships

High School Program: Four Weeks of Awesome



Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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Project Kick-Off:
AM: Facility Tour
PM: NextFlex

Evergreen CC
Field Trip
& EC Classes 1 & 2

Entrepreneurship
Class # 3

Entrepreneurship
Class # 4

Final
Presentations

Post-Course
Follow Ups and
Future
Opportunity
Presentations

Mentor
Check In # 1

Mentor
Check In # 2

Mentor
Check In # 3

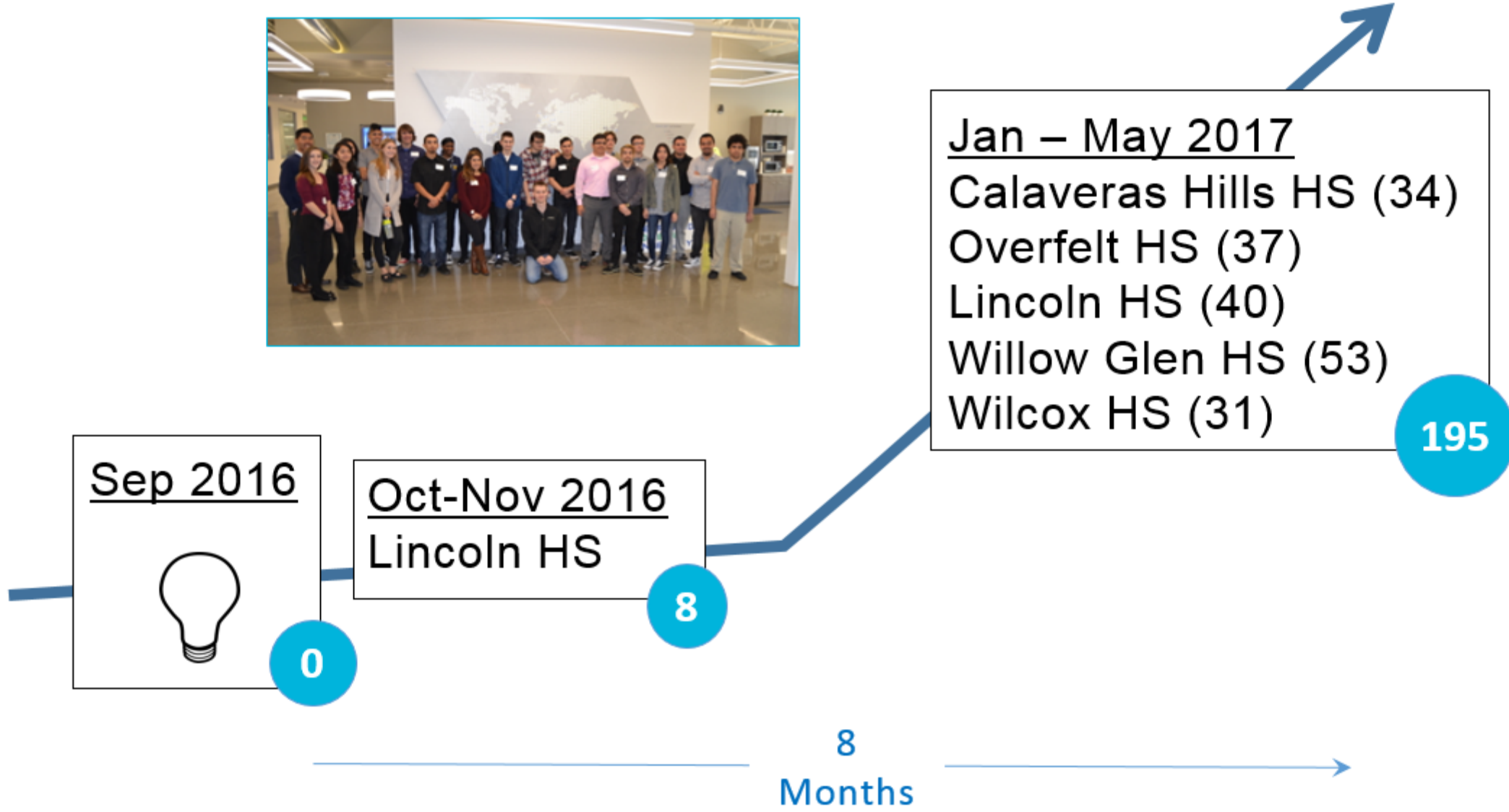
Week 1:
Define problem;
research hypothesis

Week 2:
Product and customer
development

Week 3:
Finalize Business
Model

Week 4:
Create Pitch and
Present to Panel

Program Evolution



James Walter



"Witnessing examples of thriving businesses was an extremely valuable and unique experience incomparable to others"

11th Grade Student, Lincoln High School

Stephanie Castaneda Navas



"I was able to see how a professional would think about their product. It brought engineering to a whole new level."

11th Grade Student, Overfelt High School

Craig Rose



"The FlexFactor concept is the evolutionary next step in project based learning."

Teacher, Lincoln High School

Dennis Willie



"During my time with FlexFactor I was able to explain how working at Flex would provide the engineering, business or operational career to bring these concepts to life"

Advanced Engineering Group Labs – Director; Flextronics

Vito Chiala



"FlexFactor brings real world experience to our students through an engaging project that teaches critical thinking, creativity, communication and collaboration"

Principal, Overfelt High School

Dr. Lena Tran



"We broke the traditional thinking and brought awareness to advanced manufacturing by teaching entrepreneurship (pitching, developing products, etc)"

Dean, Business and Workforce Development, Evergreen Valley College

Silicon Valley Technologist / College Instructor

Cecil Lawson



CIO/IT Program Manager;
Entrepreneurship Course Instructor
Evergreen Valley College

I think that both technology and education offer the best promise of breaking the cycle poverty for anyone that can dream and is willing to work.

As a technologist I realize that everything starts as an idea and ideas come from everywhere, including High School students.

As an educator I realize that education only occurs when the student believes the information can make a difference in their lives. My best moments are when I connect with students. Could be a story, example or discussion...I love it because I just opened their minds to greater things.

The FlexFactor program delivers the promise of a future for many students, offers a much bigger universe of possibilities for others and hope to both student and teachers alike.

Does this fit in other ecosystems?



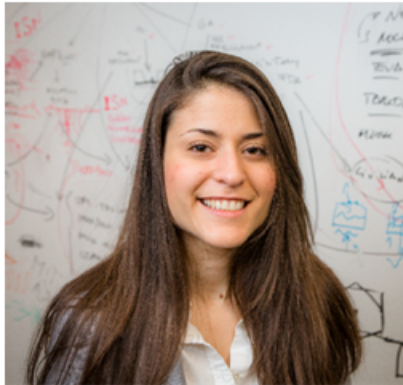
MANUFACTURING USA INSTITUTES

QUESTIONS?



AFFOA

Advanced Functional Fabrics of America



Noah Lillian Drori

Director of Education and Workforce Development





THE FABRIC REVOLUTION FROM FIBER DEVICES TO FABRIC SYSTEMS

MOORE'S LAW FOR FIBERS - Fibers that have the functionality of semiconductor devices yet are produced at fiber lengths, uniformity and cost.

FABRICS AS A SERVICE - Fabrics that see, hear, sense, communicate, store and convert energy, regulate temperature, monitor health and change color.





Mission

AFFOA is an independent non-profit; its mission is to enable a domestic manufacturing-based revolution by transforming traditional fibers, yarns, and fabrics into highly sophisticated, integrated and networked devices and systems.

Going everywhere a fiber goes

the *new* software

affoa

Confidential & Proprietary

affoa

Education and Workforce Development Goals



Goal 1

Understand the current and address the future needs of industry

Goal 2

EWD activity is specific to revolutionary fiber and textiles and is closely aligned with the technology program

Goal 3

Advise States on investments in revolutionary fibers and textiles regional economic development

the *new* software

affoa
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affoa

EWD Activity is an iterative process, designed to build upon lessons learned from successive phases

Goal

Initiative

Purpose



Needs and Assessments
 Task 1: Changes to Dept. of Commerce survey on workforce needs in textile industry

Education & Workforce Development Committee

EWD Integration in Tech Program
 Task 1: Developed a framework for capturing learnings in Project Calls

Dan St.Louis
 Executive Director,
 Manufacturing Solutions Center



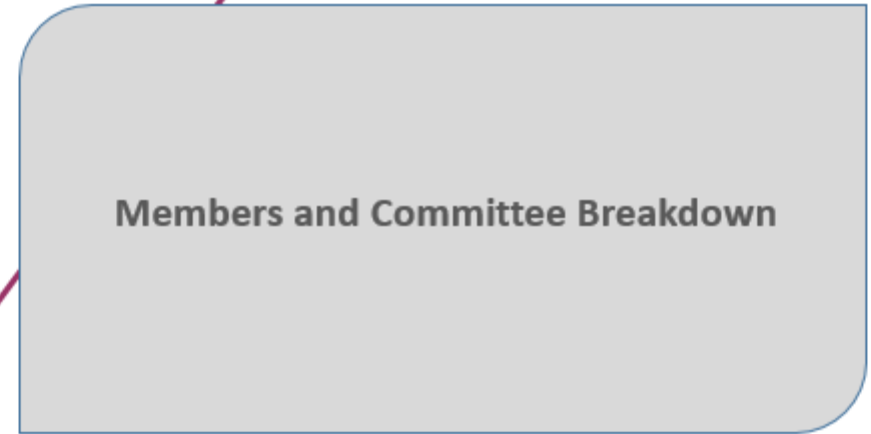
Helena Fruscio
 Deputy Assistant Secretary of Innovation, Entrepreneurship and Technology, MA



Kris Frady
 Director of the CWD,
 Clemson University



Peter Franks
 VP, Co-Op Education & Career Development,
 Drexel University



Joanne Arbuckle Deputy, President for Industry Partnerships and Collaborative Programs, FIT



Brennan Grignon Program Director, the Office of the Under Secretary of Defense for Acquisitions, Technology & Logistics



Brynt Parmeter Director of Workforce Development, NextFlex



Thaddeus Bauer Director of Workforce Development Strategies, MassMEP



Workforce Trainings:
 Task 1: Developing first-of-its kind workstudy model for the textile industry

Marilyn Barger Executive Director, FLATE



Karen Wosczyzna-Birch Executive Director, Center for Next Generation Manufacturing



David Hinks Dean of College of Textiles, NCSU



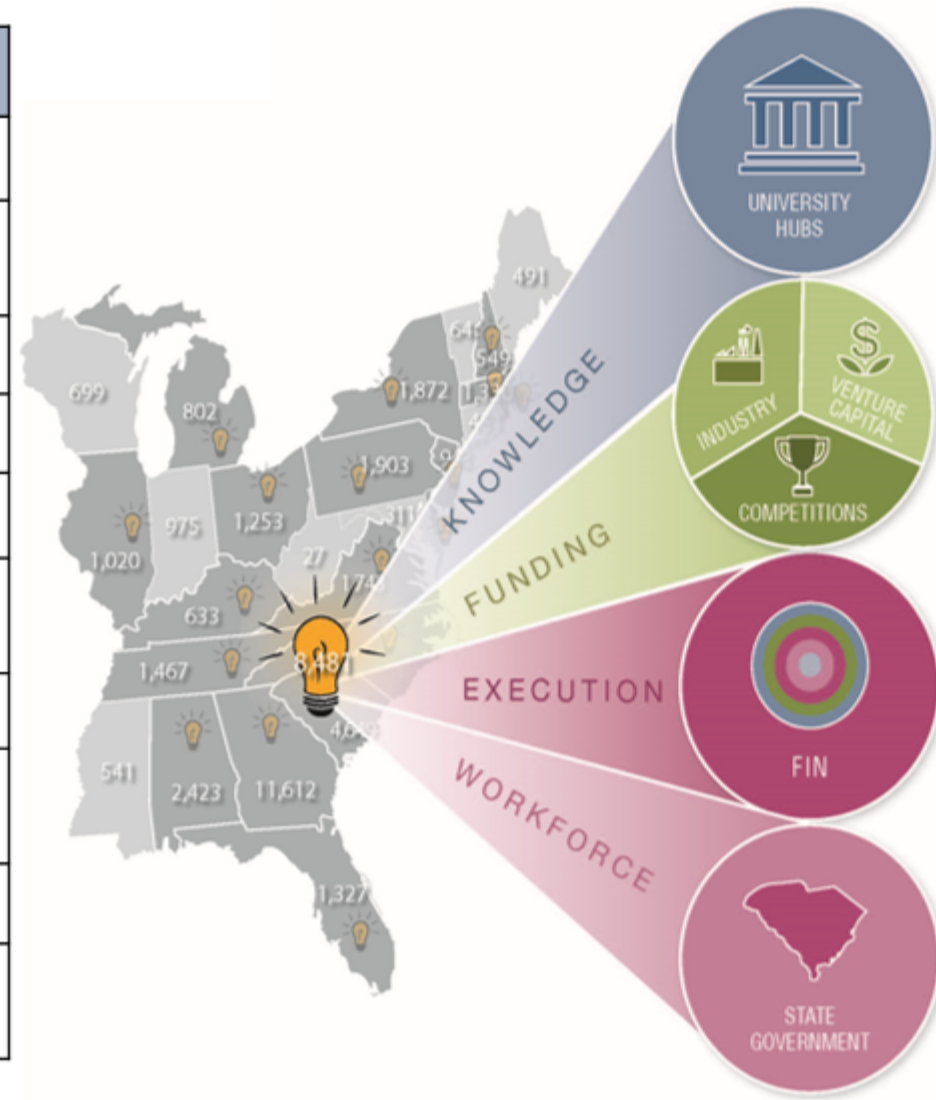
Kimberly Clavin Consultant, Pillar Technology



Advise States on Investments:
 Task 1: Constructed policies and processes for FDCs

Fabric Discovery Center Criteria

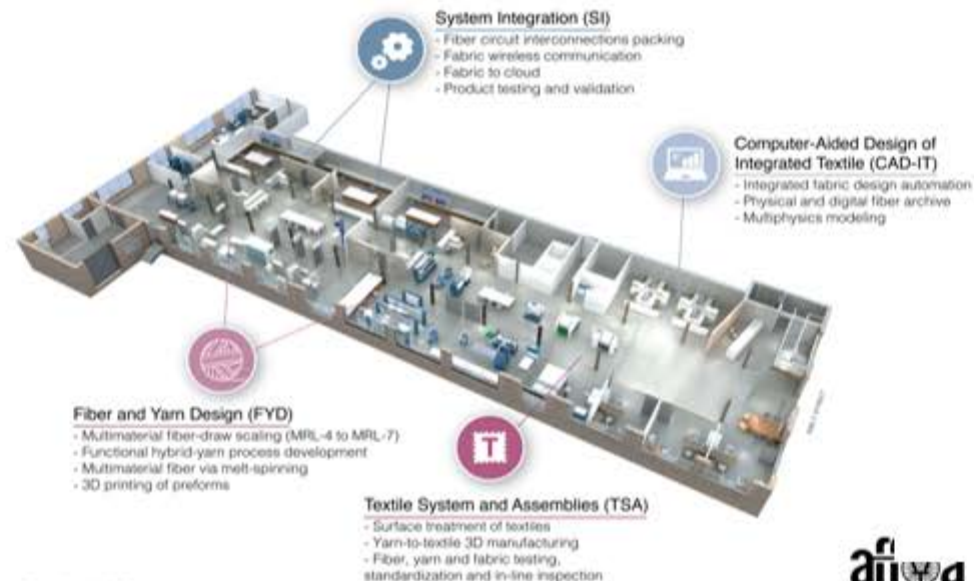
Criteria
Distinct capability with end-to-end prototyping
Technical expertise complements AFFOA's mission
Facility for prototyping line and supporting staff
Support to local startup activities
Educational and workforce development activities
Offered services to members of the institute and local/regional/national stakeholders
Promote state-by-state economic development
An annual business plan with a budget by cost type
Plan for reaching self-sustaining operation
Committed funds from the state & diverse sources



Fabric Discovery Center HQ Profile



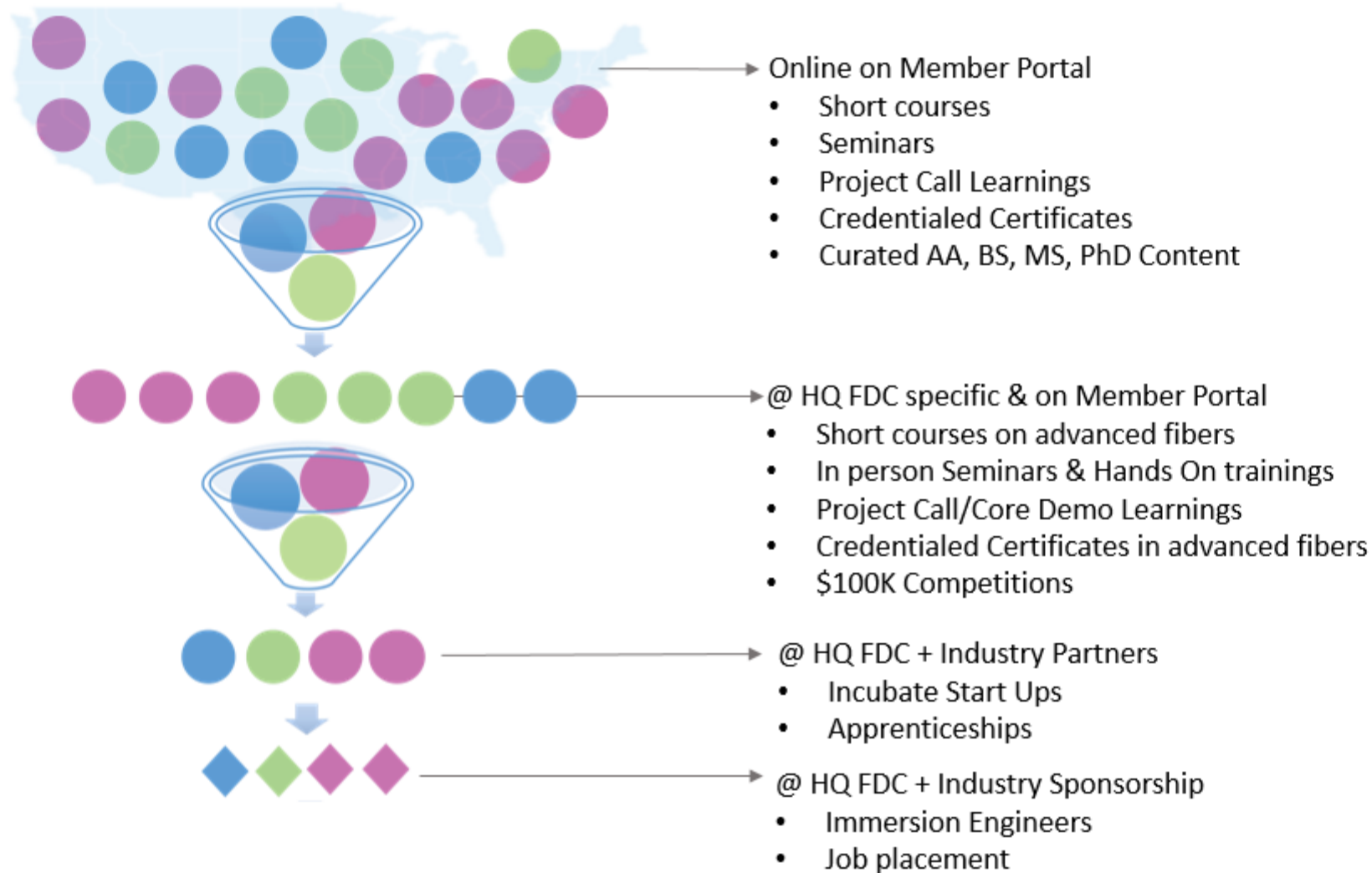
End-to-end prototyping:



Confidential & Proprietary



EWD Programming: Online & HQ



Prepare students, technicians, engineers, and researchers to build productive careers

Leveraging our Network to Create Rapid Workforce Impact & Training



Materials/Digital Fabric

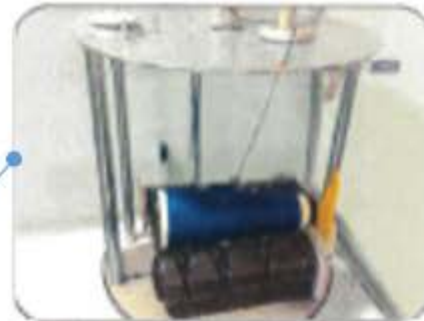


Machines

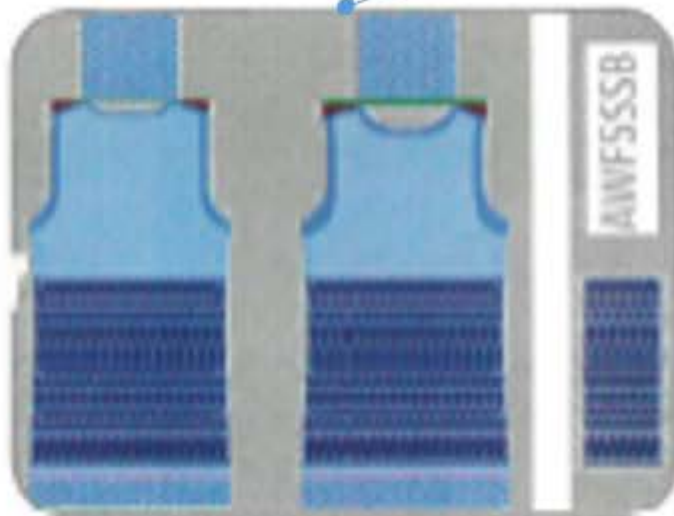


Products

Exists



New



A Learner's Experience & Development



Has Product Vision

Mollie is an entrepreneur and has a product vision.



Needs Education on Seamless Garments

To develop her product, Mollie needs to gain an education in seamless garments.



Mollie D.

CEO, Co-founder at MD Inc.
Strategist | Entrepreneur
Nashville, Tennessee



Accesses Learning Portal

Mollie uses AFFOA's learning portal to access:

- 40** *Topic Areas*
- 84** *Learning Resources*
- 18** *Teaching Modules*



Finds Collaborators

Mollie taps into AFFOA's ecosystem to find collaborators and build her supply chain.

- 91** *AFFOA Members*
- 72** *Registered Capabilities*
- 27** *Market Applications*

Digital Embodiment of our Network

Online Learning Portal

Online Teaching/Learning

Member provided content (curated):

NSCU, Principled Design, Drexel, UmassLowell

Material: videos, lectures, courses, etc

Analysis: Trends & needs **ongoing**

Develop learning pathway: on demand learning that is adaptive

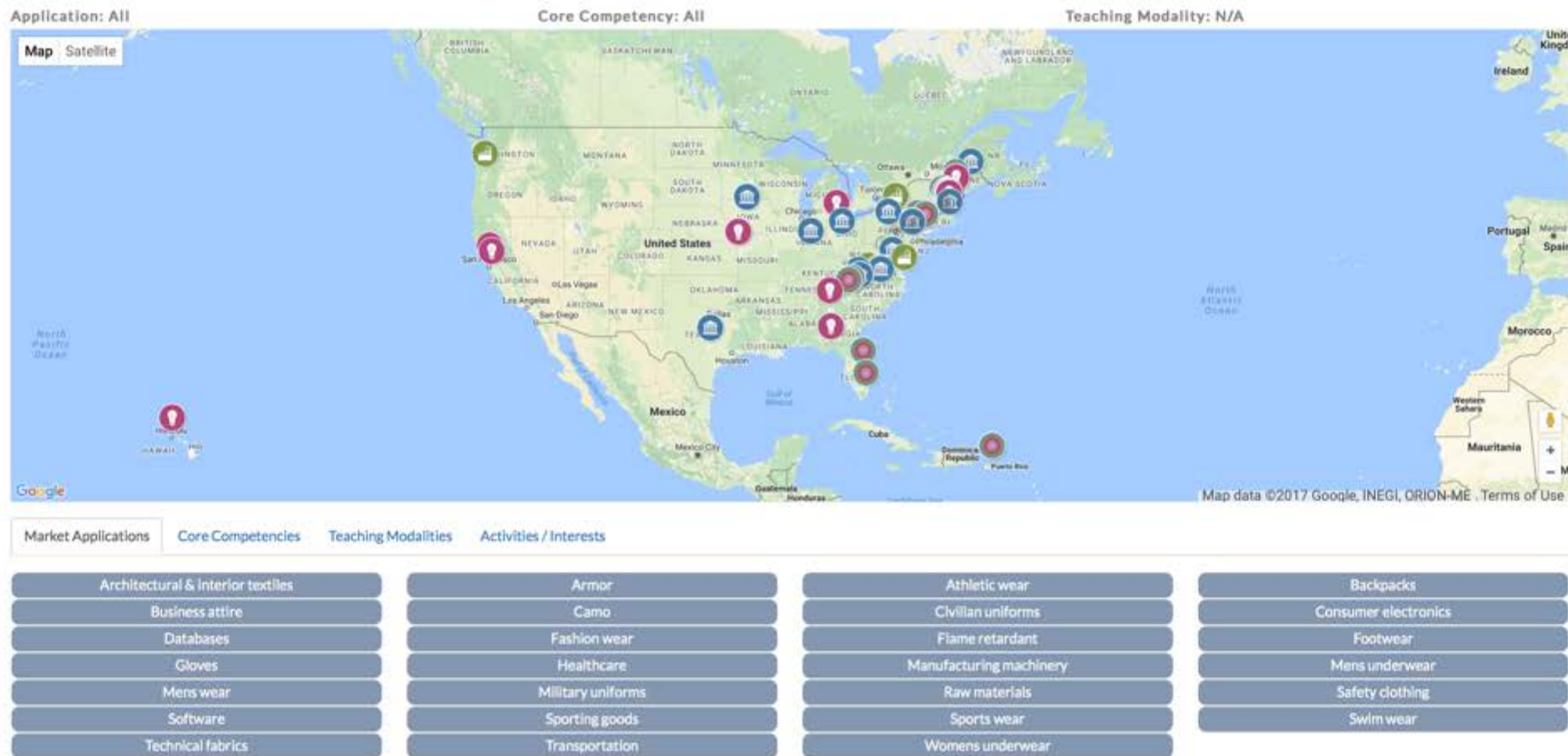
Trends, WF gaps, training needs

Learning Capture

- Microsite for Core Demonstrator Project Learnings
- Standards Tabs
- Present content from projects with the perspective view of products
- Project Management tool to monitor progress, learnings, and reports

Learning Mission

Our member geo-learning system assembles and shares capabilities and project information. The ability for any person and organization to showcase “what they DO”, “share what they LEARN”, and “offer to TEACH” is essential to the system’s success.



Application: All

Core Competency: All

Teaching Modality: N/A



Market Applications | Core Competencies | Teaching Modalities | Activities / Interests

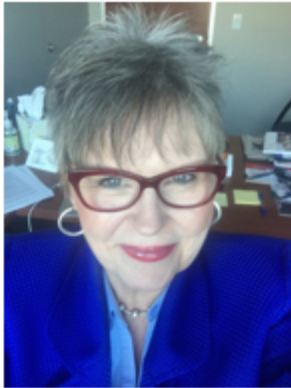
<p> Computer Aided Design for Integrated Textiles</p> <p>Product design</p>	<p>CAD design</p>	<p>Modeling</p>	
<p> Fiber Yarn Devices</p> <p>Fiber production</p>	<p>Yarn formation</p>		
<p> Textile Systems and Assembly</p> <p>Dyeing</p> <p>Textile systems and assemblies</p> <p>Mechanical coatings</p>	<p>Surface treatment of textiles</p> <p>Coating and lamination materials</p> <p>Knitting related</p>	<p>Cut and sew</p> <p>Printing</p>	<p>Lamination</p> <p>Optical coatings</p>
<p> System Integration and Testing</p> <p>Optical test</p> <p>Digital test</p>	<p>Interconnect</p>	<p>Fiber, yarn, and fabric testing</p>	<p>E-Textiles</p>
<p> All Manufacturing Areas</p> <p>Raw Materials</p>			
<p> All</p> <p>End-to-End Prototyping</p>			

MANUFACTURING USA INSTITUTES

QUESTIONS?



POWER AMERICA



Dr. Pam Carpenter

Director of Education and Workforce programs for PowerAmerica and the National Science Foundation Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Center



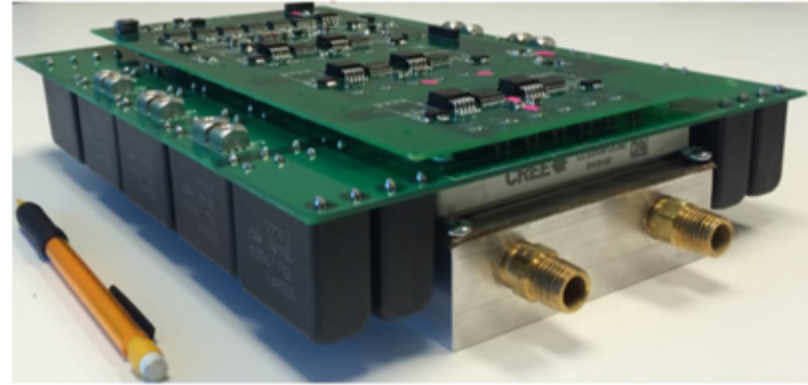


Education and Workforce Development

Pam Page Carpenter, Ph.D.
Director of Education and Workforce Programs
Affiliated Associate Professor: Technology, Engineering,
and Design Education
North Carolina State University
ppcarpen@ncsu.edu

What is Wide Bandgap Power Electronics?

- The primary goal of PowerAmerica is to catalyze the acceleration rate in the adoption of power electronics based on wide bandgap (WBG) semiconductors.
- The growth of the WBG market will generate new jobs that require people who possess the necessary advanced skill sets to design, manufacture, install, and repair WBG components and products.



Husain, 2016

First, a quick reminder of EWD's mission ...

- *Our mission is to assist educators, trainers, and industry in building an education ecosystem of “**Career pathways**” for individuals to work in the next generation wide bandgap power electronics industry*

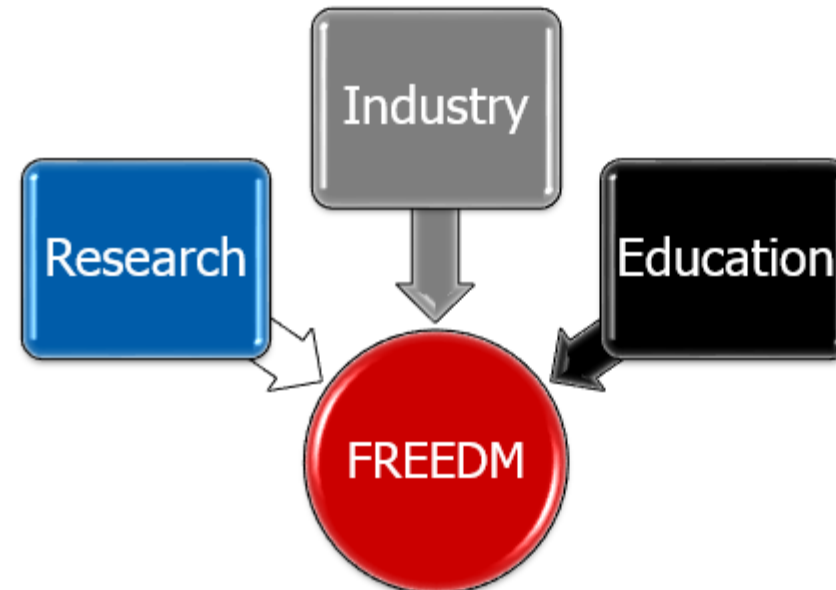


What is FREEDM?



NC State University Communications

- **Future Renewable Electric Energy Delivery and Management**
- In year 10 as an Engineering Research Center
- Grand Challenge to Modernize the Distribution Grid
- Power Electronics and Power Systems



Collaboration Efforts:



Short Courses
and Tutorials

Graduate
Education

Undergraduate
Education

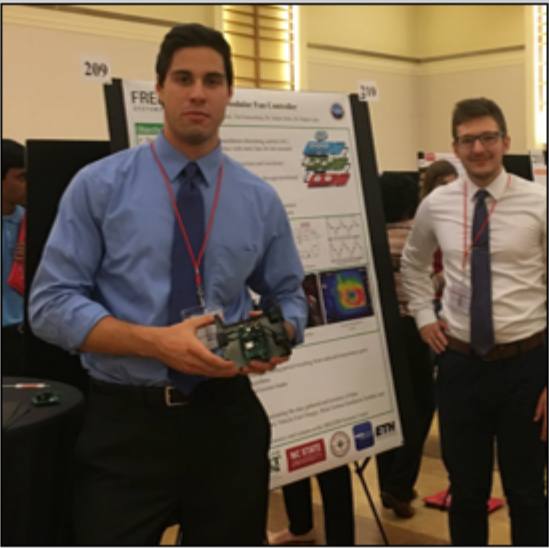
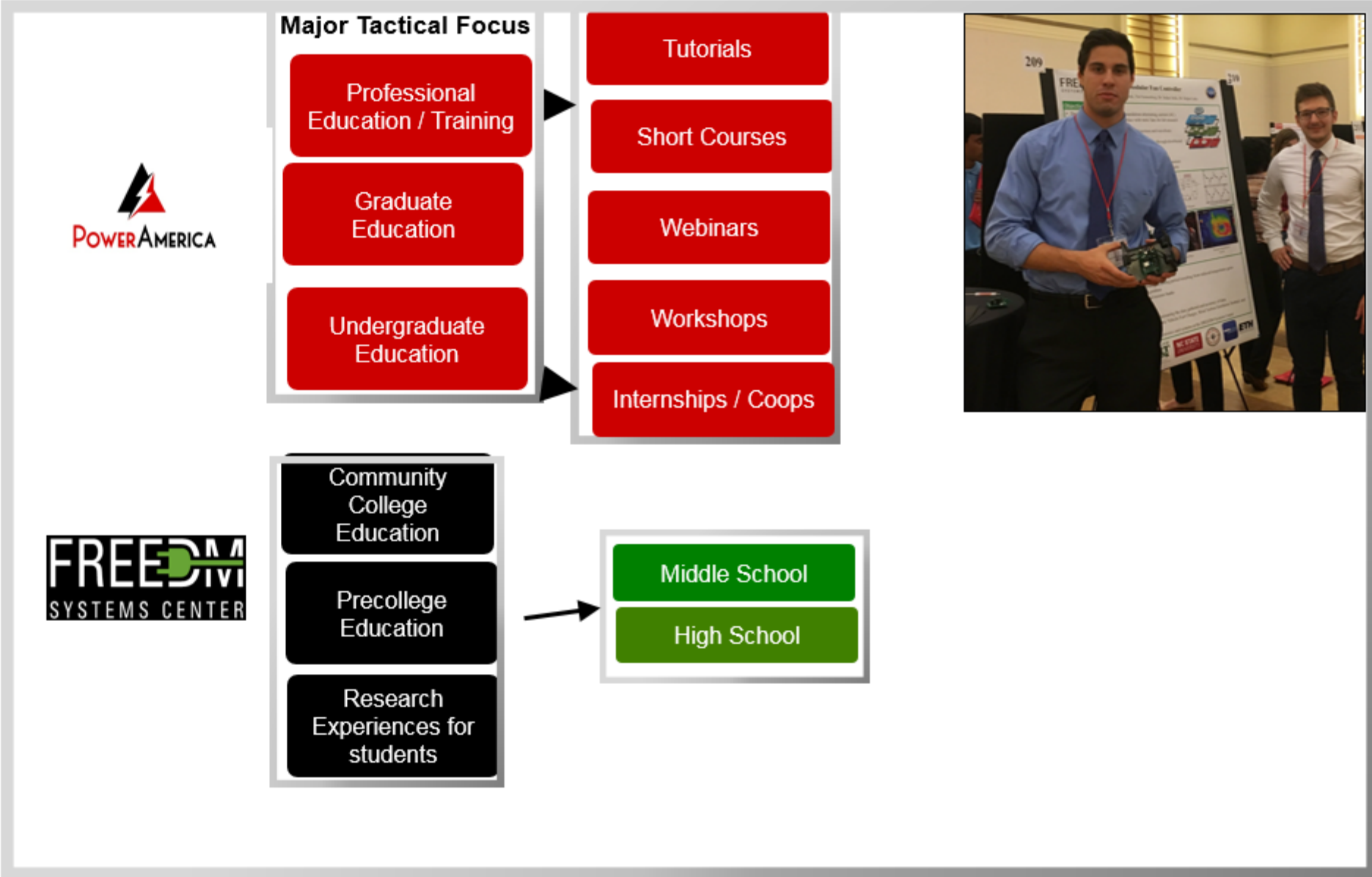
Webinars

Community
Colleges

Pre College

Outreach

Wide Bandgap Education for America's Workforce



PowerAmerica's Accomplishments

BP2-June 30, 2016-June 30, 2017



POWERAMERICA



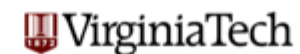
NC STATE



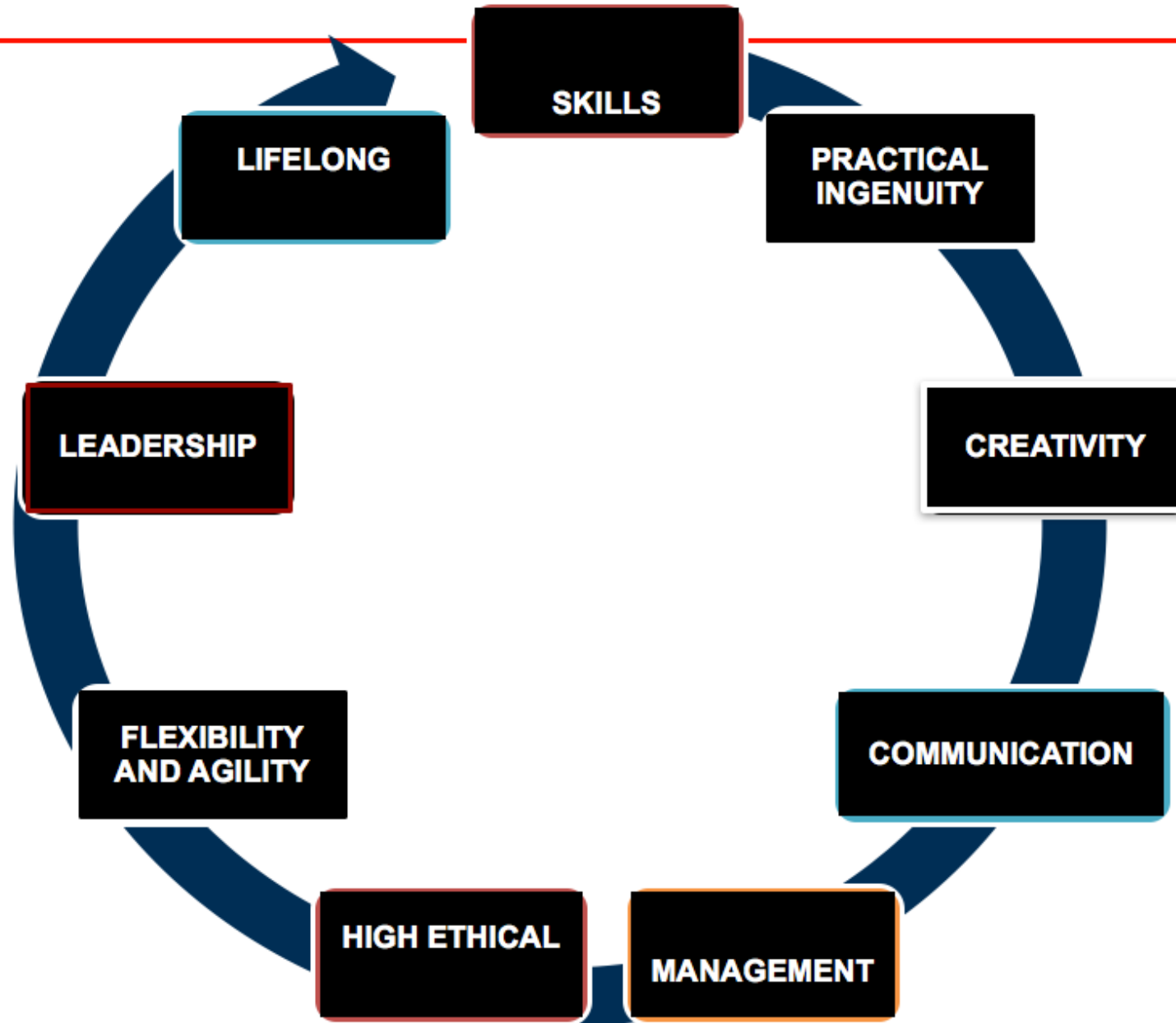
**483 Graduates in
Power Electronics
courses**

**263
Undergraduates
in Power
Electronics
courses**

**83 graduates and
30
undergraduates
involved in
hands-on training
in power
electronics**



Attributes of the Engineer Of 2020 (National Academy of Engineering)



New Programs

WBG Power Electronics
Module developed and
integrated into programs
(2017 summer programs,
STEP, undergraduate
research)

Laboratory Training for
Research Experience for
Undergraduates summer
2017

Laboratory Training for
Undergraduate Research
Scholars academic year
long fall 2017

Enhanced Proposed
Power Electronics and
Semiconductor
concentration in an M.S.
in Electric Power Systems
Engineering program

Revised education
advisory board

Goal: Leverage PowerAmerica & FREEDM Center's efforts to enhance education on WBG Power Electronics (PE)

- Enhance UG and Graduate programs that will produce the next generation power electronics engineers who will significantly advance power electronics systems using WBG technology
- Accelerate the growth in numbers of students in power electronics

Undergraduate Program

- ◆ **Renewable Electric Energy Systems Concentration**
 - ◆ Introduces students to the fundamentals of power electronics
 - ◆ Enrollment: Power Electronics courses: ~60
- ◆ **Curriculum Enhancement**
 - ◆ Enriching existing courses by introducing WBG based design: Integrated Power Electronics
- ◆ **Pipeline of Students**
 - ◆ Scholarships
 - ◆ Internships
 - ◆ Senior Design Projects
 - ◆ Undergraduate Research



Graduate Program

- MS and PhD degrees in Power Electronics (PE)
 - Both are strong programs
 - Current enrollment is 16 MS and 69 PhD students
- MS–Electric Power Systems Engineering with WBG PE Concentration-Professional Science Masters (PSM)
 - Comprehensive Program for WBG Power Electronics
 - Started Fall 2014

Devices	Fabrication	Power Electronics	Applications	Capstone
PS Devices	IC Fabrication	Power Electronics	Motor Drives	Product Innovation Lab
WBG Devices	Manufacturing Systems	Advanced Power Electronics	Machine Control	
PE Packaging		PMIC	Renewable Power Generation	

MANUFACTURING USA INSTITUTES

QUESTIONS?





THANK YOU AND JOIN US!

June 14 at 2 pm Eastern for the 2nd webinar in this series.

NSF ATE: Working with the Manufacturing USA Institutes

Register here: <http://www.atecenters.org/upcoming-webinars/>

