PowerAmerica & NextFlex
Informational Webinar

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What is GENEDGE?

We are the Manufacturing Extension Program (MEP) of Virginia

An Economic Development unit of the Commonwealth of Virginia

Part of the Department of Commerce / NIST network of Centers across the country (60 centers, 1500 staff nationally)

+20 years of success supporting Virginia businesses

Since 2000, reported >$3.5 Billion of business impact by our Clients

GENEDGE partnering with NCMEP (North Carolina MEP) on PowerAmerica Institute and CMTC (California Manufacturing Technology Consulting) on NextFlex Institute

www.genedge.org
Across the Manufacturing USA institutes, the Federal government has committed over $850 million, which has been matched by more than $1.8 billion in non-Federal investment.

- White House Fact Sheet, December 21, 2016
PowerAmerica Mission Statement

“The mission of Power America – Next generation Power Electronics Manufacturing Innovation Institute (the institute) is to develop advanced manufacturing processes and designs that will enable large-scale product and large-scale adoption of wide bandgap (WGB) semiconductors. This will allow power electronics to be smaller, faster, more robust, and more efficient than silicon systems.”
Who We Are

PowerAmerica, a public-private partnership between industry, the U.S. Department of Energy, national labs, and academia, seeks to

- Save on energy consumption
- Create U.S. manufacturing jobs

by accelerating the development and large-scale adoption of wide bandgap (WBG) semiconductor technology.

What is a wide bandgap (WBG) semiconductor

Wide bandgap (WBG) semiconductors built on silicon-carbide (SiC) and gallium nitride (GaN) compared to conventional silicon have:

- Higher operating voltage
- Faster frequency switching
- Smaller size and more energy efficient
- Superior electrical and thermal performance
PowerAmerica Introduction Video

PowerAmericaAboutUsVideo

https://www.poweramericainstitute.org/about-poweramerica/
Wide bandgap (WBG) semiconductor uses

- Compact power adapters for consumer electronics that are half the size of current technology

- More efficient electric vehicle charging systems that reduce energy losses by 50%

- More efficient industrial motors that can reduce energy consumption and maintenance costs

- More efficient power supply for data centers, reducing the space, cost and energy consumption of power equipment
WBG Technology Acceleration and Adoption

**Cost Reduction of WBG**
Comparable with silicon semiconductors

**Reliability Improvements**
Project demonstration of measurable performance increases seeding adoption by manufacturers and end users

**Performance Enhancements**
Addressing technical issues at all levels of design, manufacturing, packaging and qualification

**Integrated Supply Chain Management**
Research, development and manufacturing collaboration networks for improved supply offering

**Accelerating Advanced Manufacturing**
Educational initiatives focused on working professionals, community college, undergraduate and graduate levels.
Why join PowerAmerica?

- Network with potential customers and suppliers
- Obtain hands-on instruction from application engineers in industry
- Compete for funding to demonstrate improved SiC and GaN applications
- Gain access to academic experts in WBG technology at leading universities
- Help build and grow U.S. competence and competitiveness in this technology
- Global competitiveness and business innovations for top and bottom line growth

Current Members
Ways to Participate with PowerAmerica

- **Free** – Monthly webinars, MEP awareness training, various conferences (e.g. APEC).

- **Nearly Free ($)** – Annual meeting, workshops, networking with PowerAmerica members and others leading the WBG area (meetings are typically $100), conferences, technical presentations by PowerAmerica and members.

- **By Project Fee ($$)** – MEP assessments, training or technical help from PowerAmerica resources (project fee based on size of service provided).

- **Membership Fee ($$$)** – Member-only functions, access to funding opportunities for development projects, access to “Beta-technologies” inventory, much more... (membership fee based on company size).
Flexible Hybrid Electronics (FHE) Overview

in cooperation with NextFlex Institute
A Public-Private Partnership

Established | 28 August 2015
Lead | FlexTech Alliance
Hub Location | San Jose, California
Proposal Contributors | 145+ in 27 states
Government Agencies Engaged | 17 DOD & OGAs
Bringing Together Existing Capabilities

Disparate FHE Capabilities
- Centers of excellence with world class capabilities; Project-based interaction
- Evolved out of established, once US-led technologies

MII Funding Helps Connect Manufacturing
- Silicon Valley hub provides critical mass to ‘pull’ industries together
- Fills missing infrastructure in modeling, design, new assembly, and test
- Creates links between today’s separate capabilities, existing assembly and end-user needs
- FHE leverages other industry eco-systems and marketing channels
- Relationships and communications ensures efficiencies in investments
What is FHE?

FHE (Flexible Hybrid Electronics) combines the flexibility and lower cost of printed plastic film substrates with the performance of semiconductor devices to create a new category of electronics.
What Does FHE Enable That is Different?

Taking Electronics out of the Box...

...and Making it...

- Flexible
- Stretchable
- Conformable
- Transparent
- Biocompatible
- Lightweight
- Cost effective
FHE Examples

Standard rigid PCB to FHE conversion test sample

Thinned semiconductor test sample

Wireless body temperature measurement circuit
Market Opportunity

- The market is large
- Demand exists in supply chain for US-owned small mfg.
- Larger manufacturers need small mfg. as suppliers
- FHE adoption assistance is available

Driving Opportunities like

“….The savings realized from healthcare devices and more successful self-treatment will potentially in part make up for the shortages in doctors, nurses and care-givers as people live much longer lives and encounter more health problems than before…. ”
The applicability is not only just for large manufacturing corporations but also for small and medium size companies SMMs.
How SMMs can Engage with the Institute

• Awareness, education (briefings)
• Training (on-site, remote)
• Networking (connecting with supply chain partners)
• Adopt FHE manufacturing technology
Summary

Key Points:

1. FHE is a new manufacturing capability, Not a new technology
2. FHE is enabling new innovative applications
3. A FHE wave is coming, creating demand
Your feedback is needed!

Link available immediately after webinar
https://www.surveymonkey.com/r/poweramerica-nextflex
QUESTIONS??

www.genedge.org
THANK YOU !!
for attending
this informational webinar

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