



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Using Cluster Roadmapping to Determine Your Strategic Clean Energy Direction

May 16th, 2013

DOE's State and Local Technical Assistance Program

DOE's Technical Assistance Program



Priority Area: Strategic Energy Planning

- **Peer exchange & trainings**

- *Webinar series* over the last few months, now live on Solution Center, including community and state-focused planning
- *Join the Better Buildings Alliance and participate in Project Team, kicking off this month*
- *Attend upcoming DOE State and Local Communities Summit, May 30-31st, in Washington, DC*

- **Resources**

- *Guide to Community Energy Strategic Planning* live now on Solution Center
- NASEO State Energy Plan Database available now, analysis and Guide to State Energy Planning to be published later this year

- **Apply for one-on-one assistance and peer matching**

How to Tap into These and Other TAP Offerings

- Visit the ***Solution Center***
<http://www1.eere.energy.gov/wip/solutioncenter/>
- Submit an ***application*** for assistance
http://www1.eere.energy.gov/wip/solutioncenter/technical_assistance.html
- Sign up for ***TAP Alerts***, the TAP mailing list, for updates on our latest and greatest
TechnicalAssistanceProgram@ee.doe.gov

Using Cluster Roadmapping to Determine Your Strategic Direction

DOE Roadmapping Webinar

May 16, 2013



Overview of Today's Webinar



Byron C. Clayton, DM
*Vice President of
Cluster Acceleration*
NorTech



Bill Hagstrand
*Director of
Cluster Acceleration*
NorTech



Nick Bush
Principal
Bush Consulting Group

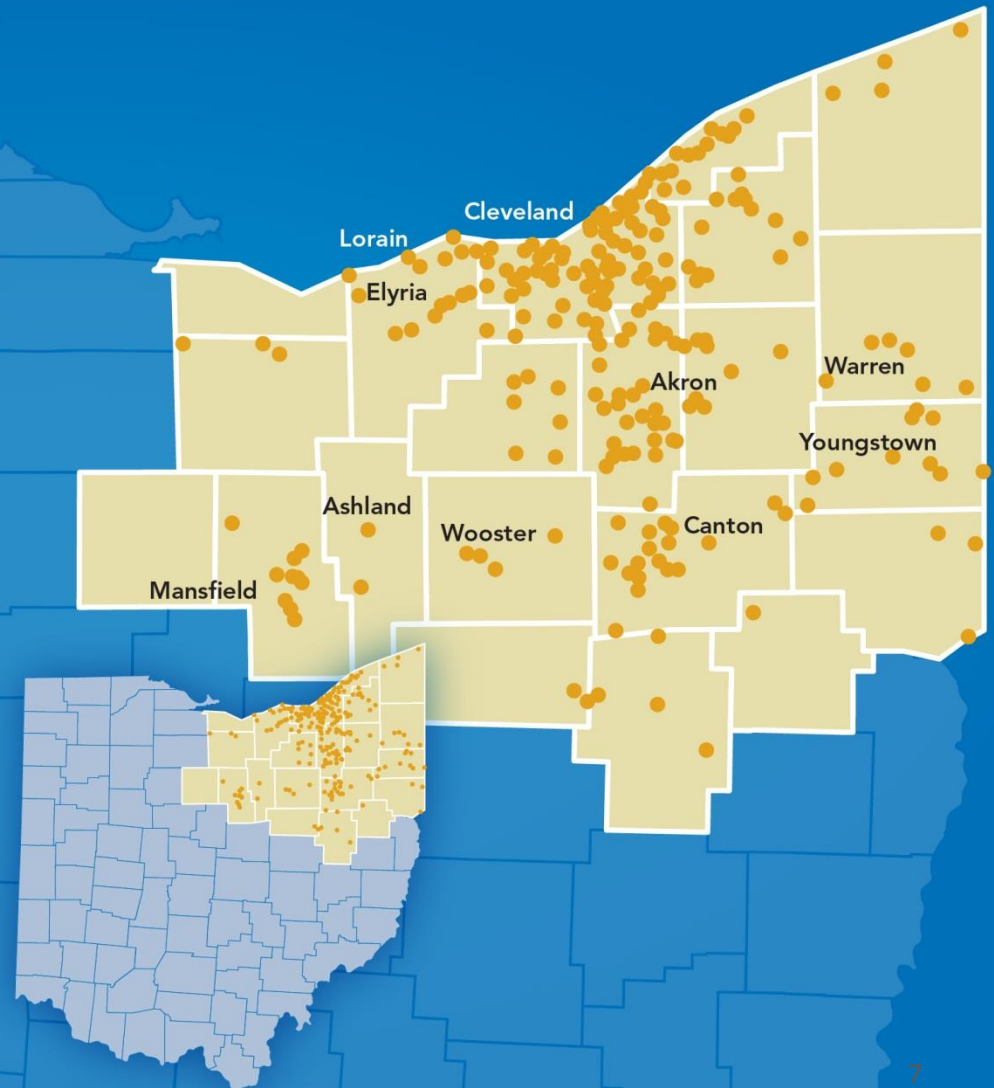
Today, we will:

- Introduce you to *InSeven* by NorTech®, our unique cluster roadmapping approach
- Explain the situation(s) for which it is best suited
- Describe its benefits and how it delivers them, using examples from NorTech's energy efficiency roadmap
- Answer questions you may have about it

Who We Are



NorTech is a technology-based economic development organization working to revitalize Northeast Ohio by accelerating the growth of regional innovation clusters in emerging industries.

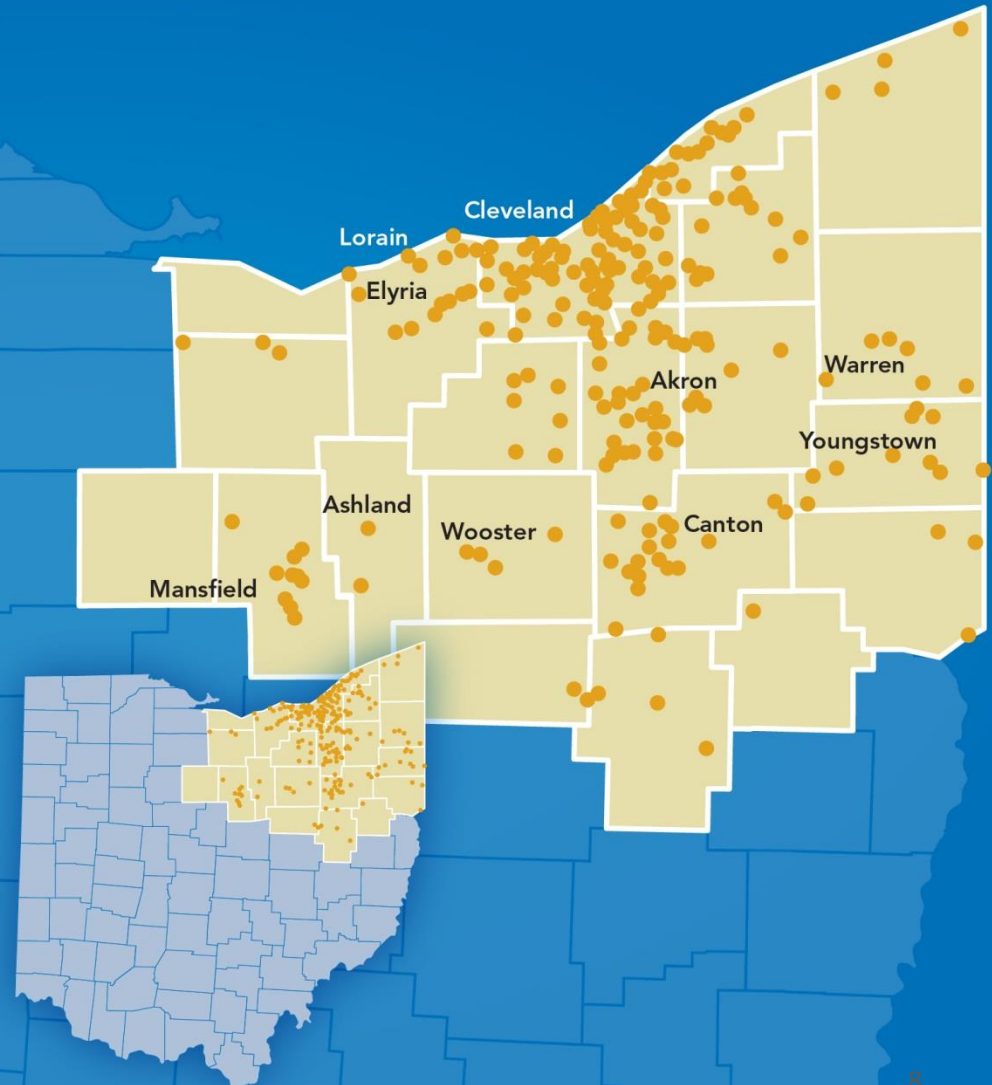


What We Do



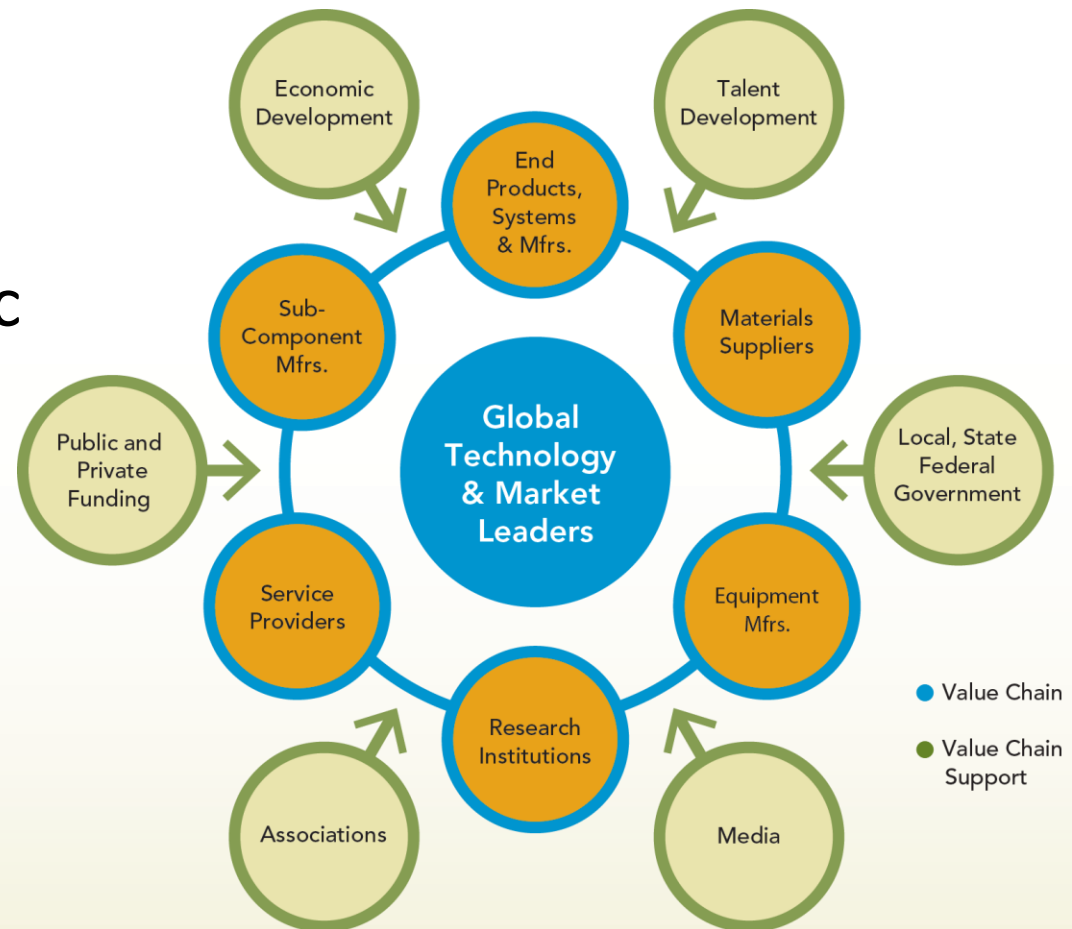
NorTech engages small, medium and large companies and universities in the **advanced energy, flexible electronics and water technologies** industries for business, funding and research opportunities that create jobs, attract capital and have long-term, positive economic impact.

NorTech also positions Northeast Ohio as a hub of innovation to attract resources and scans for opportunities in other emerging industries to grow the region's economy.

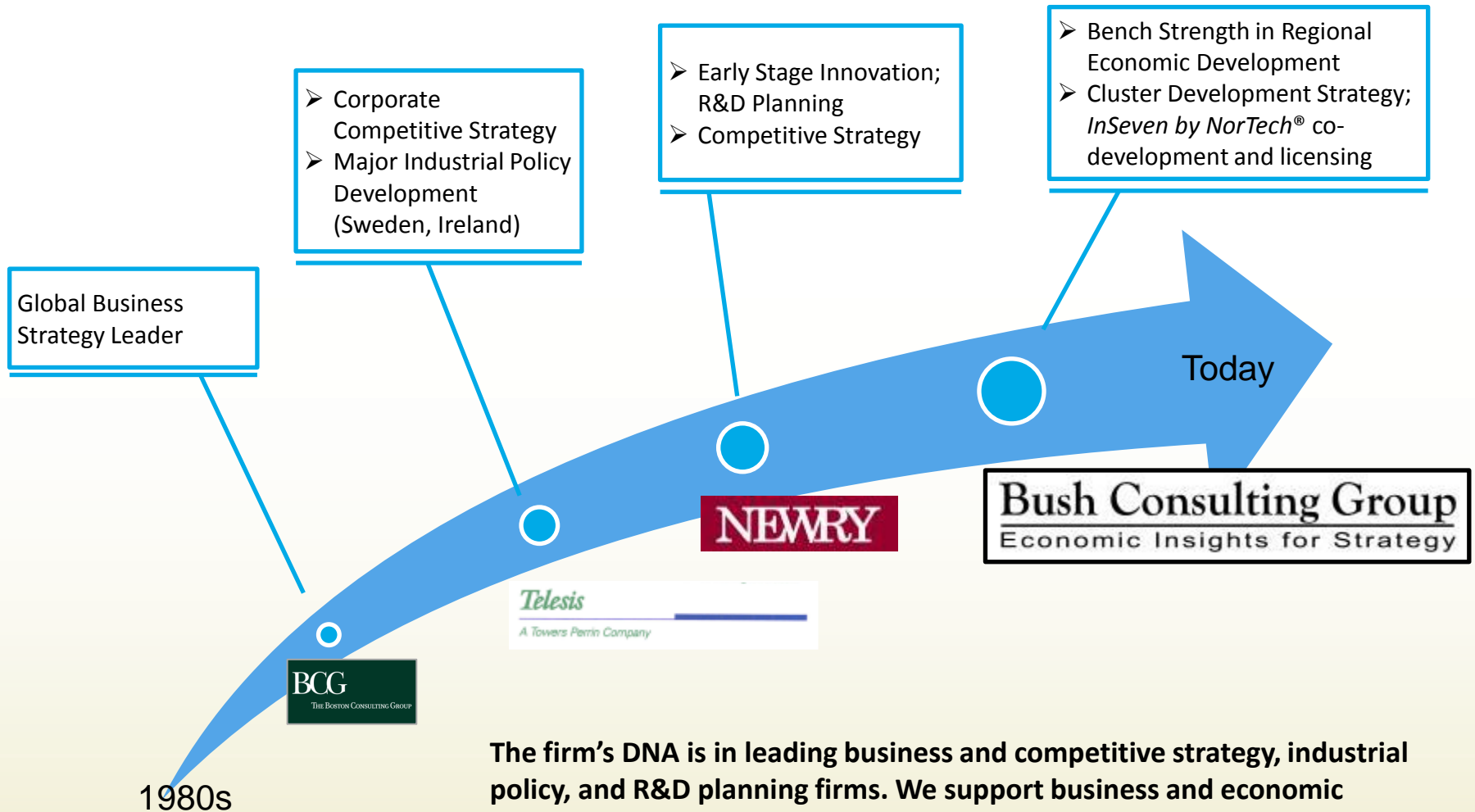


What is a Cluster?

The Brookings Institution defines clusters as "geographic concentrations of interconnected businesses, suppliers, service providers, and associated institutions in a particular sector."



Bush Consulting Group: a Management Consulting Firm with Private Sector Legacy



The firm's DNA is in leading business and competitive strategy, industrial policy, and R&D planning firms. We support business and economic development leaders, primarily in manufacturing and tech-focused organizations, in driving revenue, profit, and economic growth.

A Tool to Define and Operationalize Regional Strategic Direction



- **Builds consensus around a seven-year strategic vision** – the resulting action-oriented roadmap – developed through the voice of industry participants – prioritizes opportunities, and guides resource allocations
- **Targets growth built upon competitive “core” assets** – those that are high-value, real, differentiating, and exportable
- **Serves the needs of regions** – not a national strategy or a plan for individual companies, *InSeven* aligns well to the scope and authority of most regional economic development groups
- **Enables measurement** – by setting a baseline and growth targets for jobs, revenue, local market share, and capital investment within the region

InSeven Provides Industry-Driven Focus Based on Regional Competitive Advantage



- *InSeven* results in a roadmap which can be executed
- It is particularly well-suited to:
 - Technology-based manufacturing industries
 - Regions where potential focus areas have been identified at the industry level
- It is crafted to address deficiencies in:
 - Appropriately narrow focus
 - Discernment of regional competitive advantage
 - Business community engagement and buy-in

InSeven Engages an Industry-Focused Working Group to Shape the Plan



Perspective	Name and Title	Organization
Technology or Service Company	Clarke Berdan II, R&D Leader	Owens Corning
	John Butkowski, Sr. Product Engineer	RW Beckett/Beckett Energy Systems
	Ryan Chittester, Engineer	
	Steve Craig, President	UniControl Inc.
	Mark Duffy, LFL Global Systems Manager	GE Lighting
	Joseph Howley, Industry Relations Manager	
	Jonathan Histed, Sr. Marketing Manager	Novar/Honeywell
	Dave Mayewski, Sales Development Leader	Rockwell Automation
	John Seryak, Founder and CEO	Go Sustainable Energy
Franc Sever, Engineer		
	Ed Zdankiewicz, Business Development Manager	EchoGen Power Systems
University	Dr. Yilmaz Sozer, Assistant Professor	University of Akron
	Hongping Zhao, Assistant Professor	Case Western Reserve University
End User	Joyce Mihalik, Vice President, Energy Services	Forest City Enterprises
	Jon Ratner, Vice President, Sustainability	
Influencer	Larry Boyd, Director	Industrial Technologies Program, Energy Industries of Ohio
	Nicole Stika, Sr. Manager, Education Programs	Council of Smaller Enterprises
Government	Steve Bossart, Lead Energy Analyst, Project Mgt. Center	USDOE National Energy Technology Lab
	Chad Smith, Deputy Chief	Ohio Department of Development

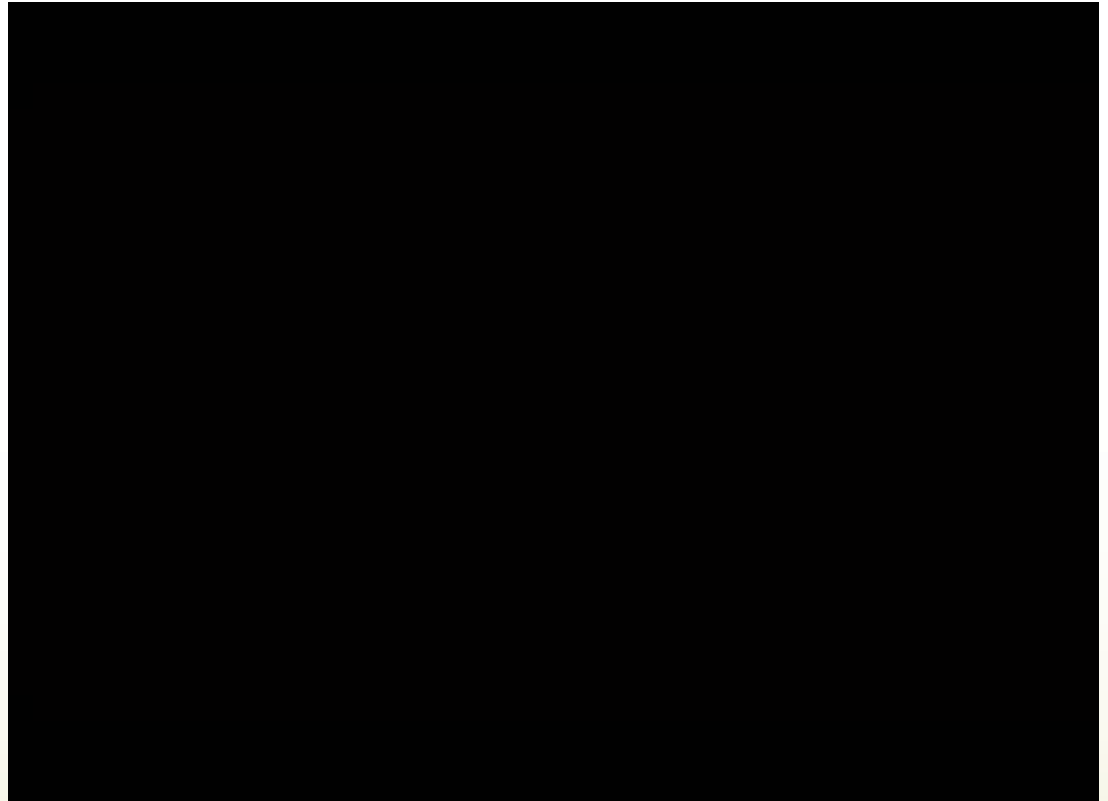
Video Testimonial



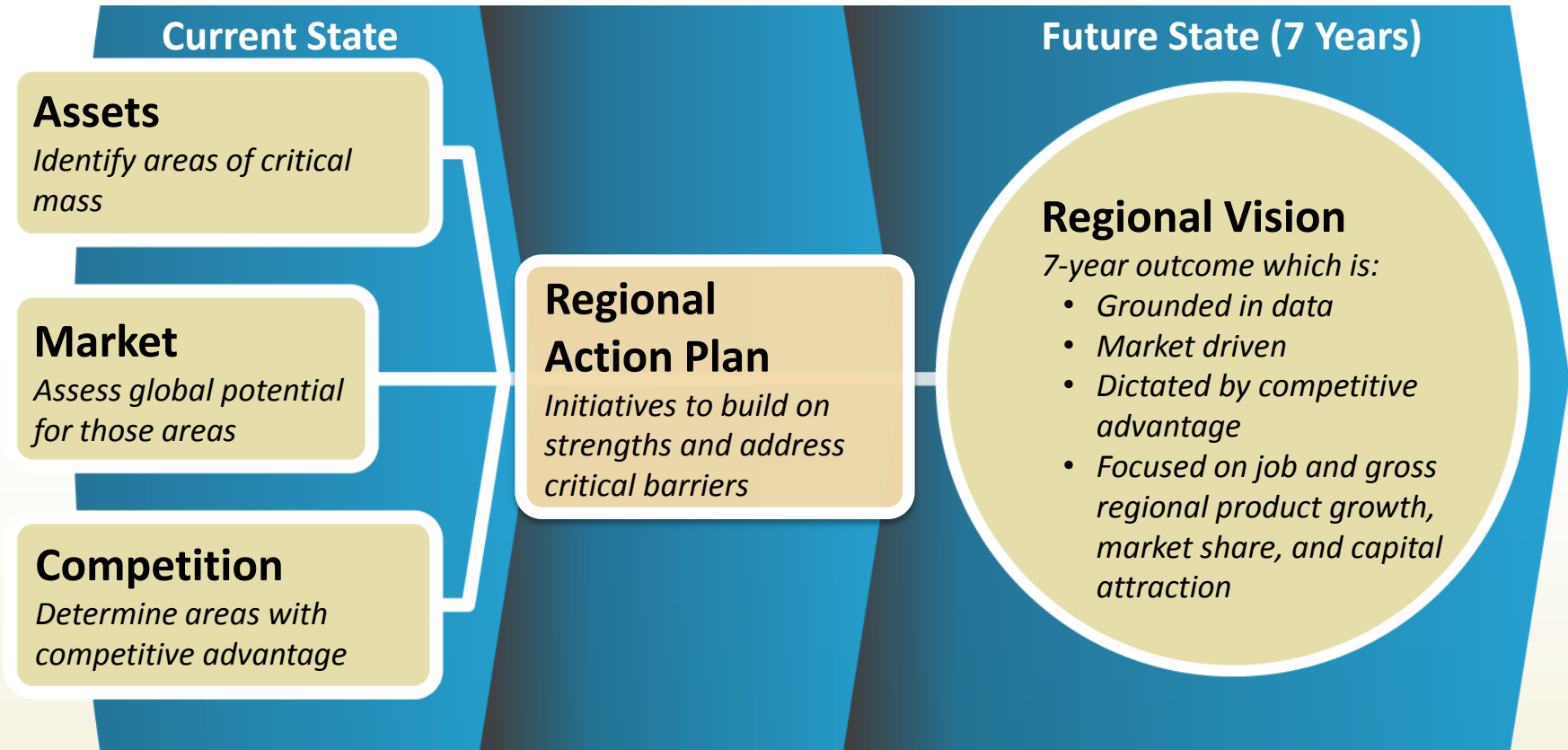
Dave Mayewski

Sales Development Leader

Rockwell Automation



InSeven Guides the Working Group in Leveraging Insight to Drive Action



Energy Efficiency Hierarchy: 48 Technology Systems and 9 Service Categories



Steam Generation	Industrial Cooling	Building Envelope	Water Heating Appliances
S01: Boiler System S02: Steam Distribution System	S14: Compressor System (Industrial Chiller/Heat Pump) S15: Chiller/Heat Pump System S16: Cooling Tower System	S24: Cool Roof System S25: Green Roof System S26: Insulation and Refractory System S27: Building Phase Change Material System S28: Exterior Window System S29: "Smart Glass" Window System S30: Exterior Door System S31: Daylight System	S37: Solar Thermal Water Heating System S38: High Efficiency Gas Storage Water Heater System S39: Electric Water Heater System S40: Gas Condensing Water Heater System S41: Whole-Home Tankless Water Heater System S42: Micro-CHP Water Heater System
Heat Recovery	Data Center	Advanced Lighting	Additional Major Appliances
S03: Heat Recovery System S04: Indirect Fired Absorption Chiller System S05: Heat Recovery Desiccant Dehumidifier System S06: Combined Heat And Power System (Packaged)	S17: Data Center Power System S18: Data Center Liquid Cooling System	S32: LED Lighting System S33: Linear Fluorescent Lighting System S34: Compact Fluorescent Lighting System S35: Metal Halide Lighting System S36: Low/High Pressure Sodium Lighting System	S43: Refrigerator/Freezer System S44: Dehumidifier System S45: Clothes Dryer System
Process Heating	Advanced HVAC		Advanced Controls
S07: Fuel-Based Process Heating System S08: Electric-Based Process Heating System	S19: Furnace System S20: Central Air Conditioner System S21: Air-Source Heat Pump System S22: Water-Source Heat Pump System (incl. Geothermal) S23: Air Handling and Distribution System		S46: Energy Management System S47: Advanced Process Controls Systems S48: Demand Response System
Compressed Air			
S09: Air Compressor System S10: Compressed Air Distribution			
Advanced Motors, Pumps, Fans			
S11: Advanced Motor System S12: Advanced Pumping System S13: Advanced Fan System			

Enabling Services (also quantified)

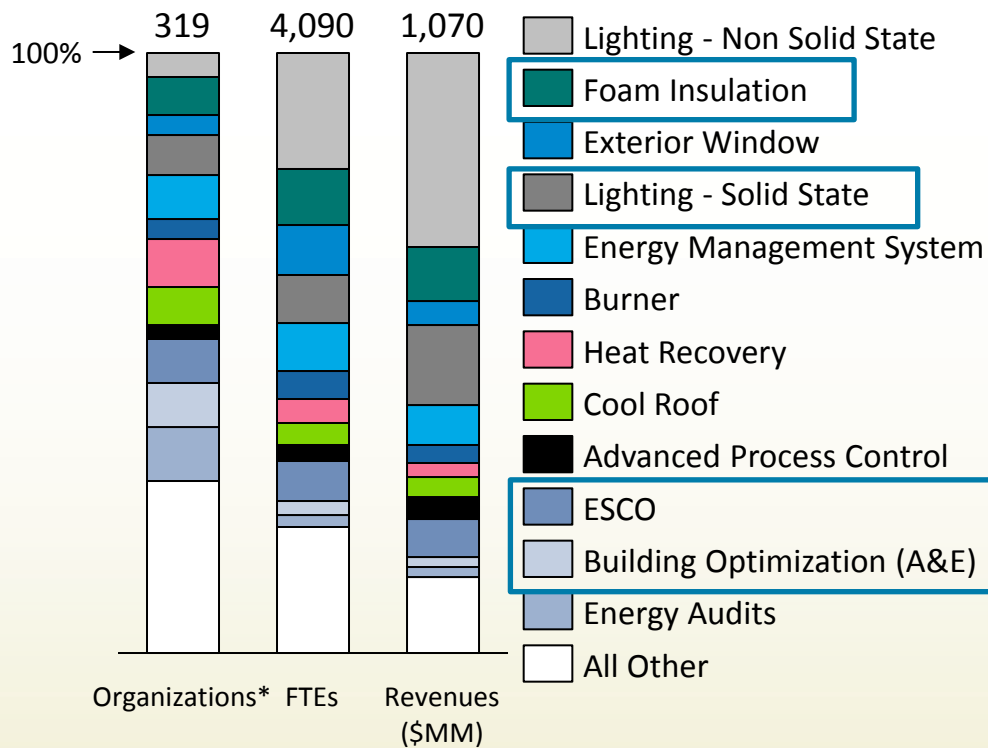
- Energy Service Companies (ESCOs)
- Building Optimization (A&E)
- Industrial Process Optimization (A&E)
- Specialized Financing Services (excl. banks)
- Energy Efficiency Certifications/Standards
- Energy Audits
- Specialized, 3rd Party O&M
- **Note: System-specific design/specification and equipment categorized by technology system**

Energy Efficiency Asset Inventory: 224 Organizations with 4,000 FTE and \$1.1B



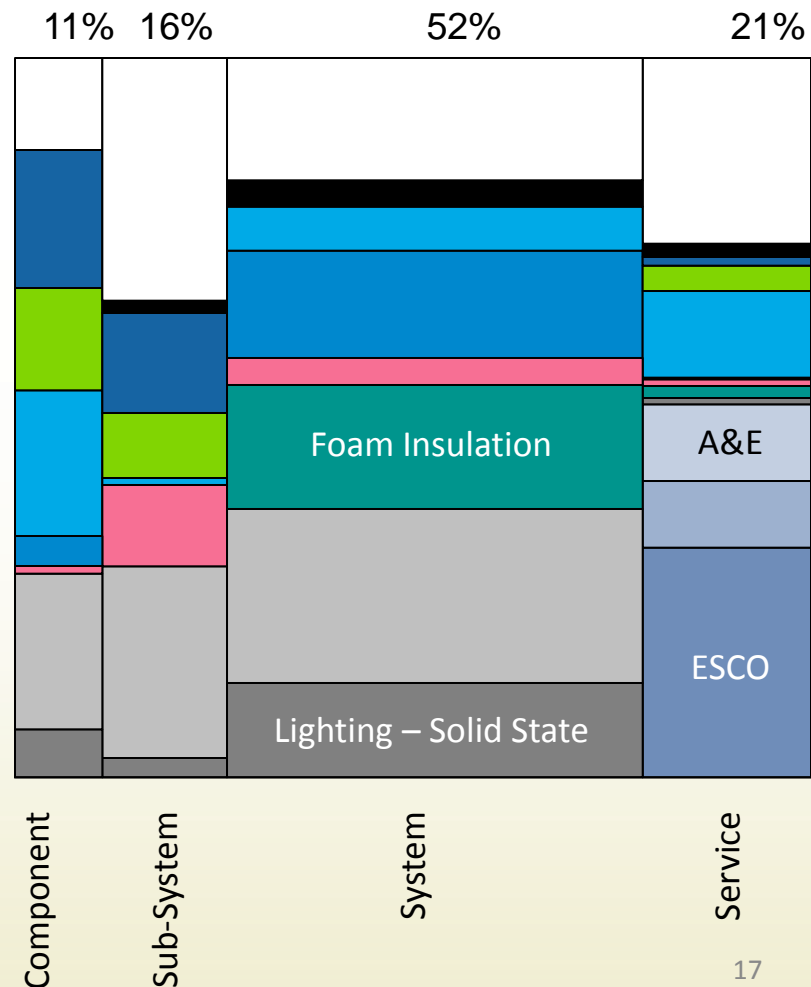
Northeast Ohio Energy Efficiency Assets:

- 224 unique organizations*
- 4,090 employees
- \$1.07 billion in revenue



Regional Energy Efficiency Employment, 2011

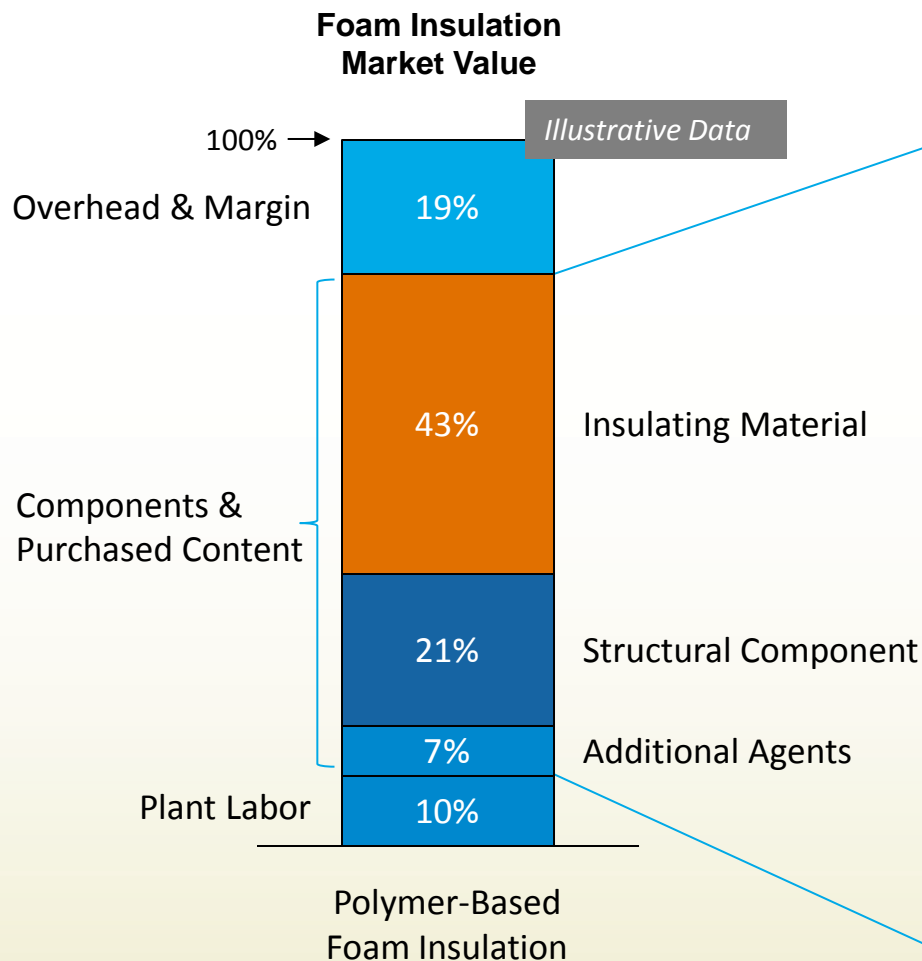
100% = 4,090 FTE



*319 total shown in diagram reflects organizations with activity in multiple systems

Focus areas selected after market and competitive assessment

Insulation Value-Added Structure: Understanding 71% Purchased Content



Representative Foam Insulation Purchased Content

Insulation Bill of Materials	% Purch. Content
Polymer-Based Insulating Material	~60%
Polystyrene (MEPS, XPS, EPS)	
Polyisocyanurate	
Polyurethane	
Cementitious Foam	
Phenolic Foam	
Structural Form Components*	~30%
*N/A for batt, blanket, loose-fill, spray foam	
Structural facing (e.g., rigid board)	
Radiant barrier facing (e.g., foil)	
Foaming agents	
Blowing agents	
Getters	
Dessicants	
Fire retardants	
Adhesive agents	
Binding agents	
	~10% (all add'l agents)
TOTAL:	100%

Insulation Competitive Assessment: Strength in Market Leadership, Innovation



Northeast Ohio Competitive Advantage in Insulation:

- Market leader presence, with concentration of manufacturing across value chain, including enabling equipment
- Innovation assets
- Production labor availability
- Cost of engineering, production labor, and energy

Midland, MI – Insulation

- Market leadership by Dow Chemical in foam insulation

SIMILAR TO REGION

Columbus, OH - Insulation

- Insulation IP leadership due to Owens Corning R&D and Progressive Foam Technologies
- May represent opportunity for statewide synergy vs. regional competition

SIMILAR TO REGION

Philadelphia, PA– Insulation

- Federally funded Energy Efficient Buildings Hub, with emphasis on building envelope technologies
- CertainTeed HQ and Insulation Technology Center (fiberglass focus)

SIMILAR TO REGION

*Building Efficiency Services not reflected because market and competition assumed limited to Northeast Ohio and neighboring counties.

The Outcome: a Highly Specific, Industry-Supported, Measurable Game Plan



Regional Strengths

- Solid State (Lighting) and activity along horizon are
- Foam insulation R&D led by a range of a
- Dozens of providers share and

Critical B

- Solid State largely Asi competit
- Deep retro insulation coverage,
- Building e a mechan
- sourced technologies

Highest Priority Goals

Vision

By 2020, Northeast Ohio will be recognized as a leader in:

- *Solid state lighting solutions and supply chain – through emphasis on collaborative development of a cost-competitive supply base;*
- *Polymer-based foam insulation deployment – via unique financing models and policies that drive substantial deep building retrofits;*
- *Building efficiency services that pull through local content – driven by the development of local content standards and proactive engagement with local energy technology customers who would benefit from sourcing NEO-based solutions.*

Actions (Goal 2 example only)

ng
ulation,
ng mfr's and

deep retrofit
st significant

r develop
cing model
/or gov't

n the Eastern
and for NE

rs to support
state policy
ewal or
Energy Policy
on, PACE
program, On Bill Financing)

applicable capabilities, gaps, and potential impact by 2015.

Video Testimonial

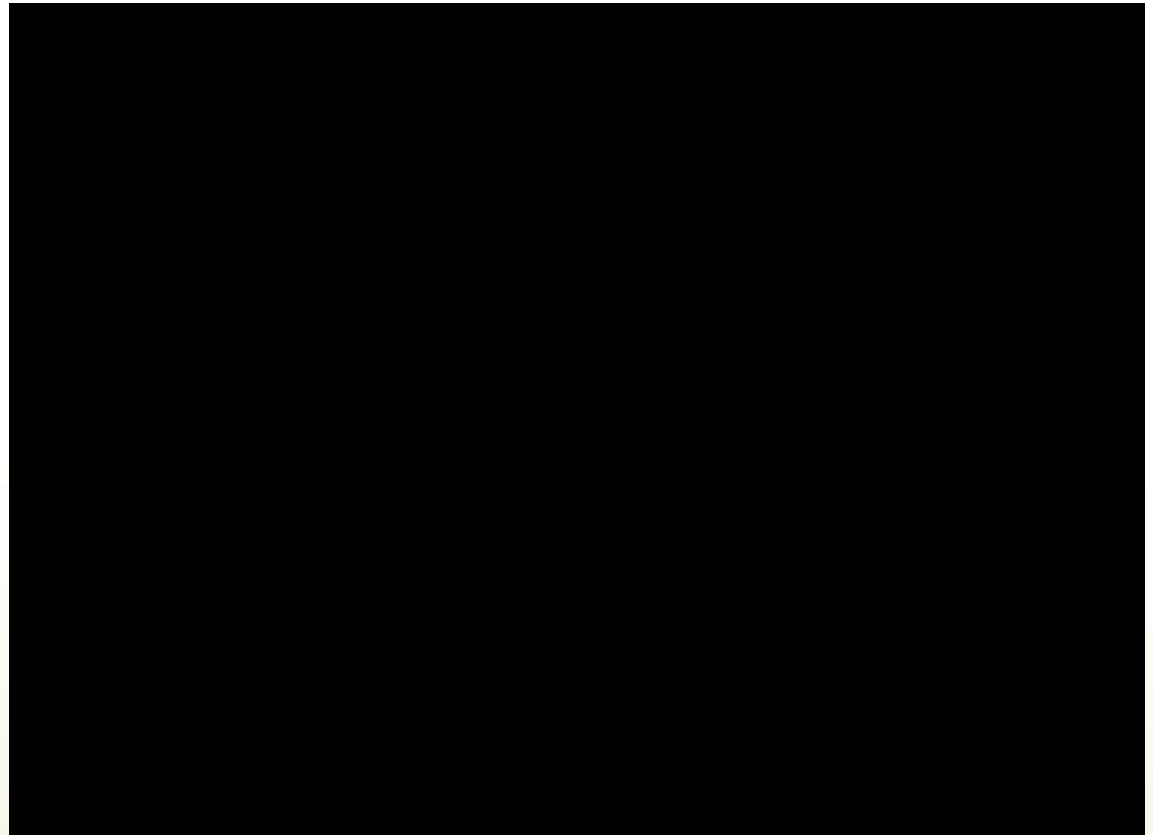


Dr. Ajay Mahajan

Associate Dean for Research

Mechanical Engineering

University of Akron



InSeven Builds Depth of Knowledge and Credibility in Specific Industries



SUNDAY
THE PLAIN DEALER

Date: Sunday, June 19, 2011
Location: CLEVELAND, OH
Circulation (DMA): 348,324 (17)
Type (Frequency): Newspaper(S)
Page: D1.D5
Keyword: NorTech

NorTech sees \$30 billion potential market for Northeast Ohio advanced energy companies



Clean Economy Jobs Grow in Most Major U.S. Cities, Study Reveals



Surprising Areas See Growth In Green Jobs



Gas Boom Deflates a Budding Lake Erie Wind Venture

BROOKINGS

SIZING THE CLEAN ECONOMY



A NATIONAL AND REGIONAL GREEN JOBS ASSESSMENT



U.S. DEPARTMENT OF ENERGY

Questions?



For more information, contact:

Bill Hagstrand

Director of Cluster Acceleration

NorTech

216-363-6887

bhagstrand@nortech.org

www.nortech.org