

UMASS AMHERST

November 2, 2011

Dear Member of the Cleantech Economy,

Welcome to the 4th Annual Clean Energy Connections Conference and Opportunity Fair.

In 2008, Massachusetts passed landmark legislation making our state the first in the nation to embrace the promise of green. Our timing with that first Clean Energy Connections conference couldn't have been better as we heralded the potential of the green economy. This year, for our 4th conference, we've selected the theme, ***Building on Success***, as we celebrate the sustainability successes in Massachusetts and the entire New England region.

During today's program, you'll hear a lot about this progress. Massachusetts was recently ranked first in the nation in energy efficiency by the American Council for an Energy-Efficient Economy, with our New England neighbors of Vermont, Connecticut and Rhode Island finishing in the top ten. The number of jobs created in the clean energy sector in Massachusetts increased by 6.7% since last year. Many of you are working to expand this success. Initiatives like the iGreen Partnership, which you'll hear more about today, are working to grow the New England Cleantech Regional Innovation into our economy.

Our speakers today come from as far away as California and Colorado to as nearby as Holyoke and Springfield. This conference has always been about bringing together the different sectors of the cleantech economy – the students, educators, researchers, entrepreneurs, business owners, financiers, workforce developers, and policymakers – to make those connections and enable progress. We define cleantech broadly and inclusively: from energy efficiency to sustainability and renewables, from services to high technology

The opportunity fair – a fabulous place to network and soak in all the excitement and energy of the growing green economy – has a rich complement of companies, organizations and institutions of higher education. Be sure to participate!

UMass Amherst is once again proud to organize this event. As the flagship campus of the UMass System, the campus was recently awarded the coveted gold seal by the American Association of Sustainability in Higher Education, recognizing our accomplishments in Education and Research; Operations; Planning, Administration and Engagement; and Innovation. We are living green, teaching green, and leading green.

Thank you, and have a great day.



Marla Michel, Conference Chair

University Relations, University of Massachusetts Amherst
Scibelli Enterprise Center, Springfield Technical Community College



THE CITY OF SPRINGFIELD, MASSACHUSETTS

MAYOR DOMENIC J. SARNO

HOME OF THE NATIONAL BASKETBALL HALL OF FAME

October 20, 2010

Greetings:

As Mayor of the City of Springfield, it is my distinct pleasure to welcome you to our fine City and to this 4th Annual Clean Energy Connections Conference and Opportunity Fair. Springfield is becoming renowned for being a leader in clean and green development, having been named to the "Best Green Cities" list by *Country Home Magazine* in 2007 and 2008.

In addition, we are focusing our efforts to support the development of emerging technologies like Clean Energy. For example, Springfield is one of the only cities in Massachusetts that exempts R&D companies from local personal property taxes. In 2011, the city partnered with Northeast Utilities to construct a solar energy field atop former industrial land. We have also continued to invest in energy saving improvements for our public buildings and our new Putnam Vocational High School and our newest fire station gained attention for its LEED certification. The City's Green Seal program recognizes those companies who lead the effort to reduce their energy use and implement sustainable business practices. Our efforts have not gone unrecognized. An attendee at the 2010 conference, Green Monster E-Cycling, decided to open a Springfield location and partner with Keep Springfield Beautiful to provide businesses and residents with an effective way to dispose of electronic waste.

We greatly appreciate our partnership with the University of Massachusetts-Amherst on many initiatives and for organizing this annual conference. Our local colleges continue to demonstrate their support for the growing clean energy sector. American International College and Western New England College are offering bachelors and masters level curriculum in green business and sustainability. Springfield Technical Community College is the home of the MassGREEN Initiative, established in July 2009, which develops and delivers energy efficiency workforce training programs around the state.

Springfield has a thriving business community and we are proud that large companies like MassMutual Financial Group, Smith & Wesson, Big Y Foods, Merriam-Webster, Performance Food Group, Health New England and Peter Pan Bus Lines and major healthcare providers Baystate Health Systems and Mercy Medical Center all call Springfield home. We welcome the companies - the participants of this conference - to succeed here too. Our City remains committed to supporting all our local companies so they can compete in this global business environment.

Please enjoy your time today both at the conference and here in the City of Springfield.

Respectfully,

Domenic J. Sarno

City of Springfield • 36 Court Street • Springfield, MA 01103 • (413) 787-6100

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Program Schedule

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|---------------|---|
| 8 :00 | Registration – 1st Floor Lobby Continental Breakfast – 2nd Floor Atrium Opportunity Fair is OPEN – Ballrooms B & C, 2nd Floor |
| 9 :00 | Welcome ! Program Begins – Ballroom A, 2nd Floor Opportunity Fair is CLOSED during Program |
| 9 :20 | Keynote 1 : Developing a Clean Energy Regional Innovation Cluster – Ballroom A, 2nd Floor |
| 10 :20 | Networking Break Opportunity Fair is OPEN – Ballrooms B & C, 2nd Floor |
| 10 :50 | Concurrent Sessions 1 : 1A : Ramping It Up : From Marketing to Partnerships – Rooms 2 & 3, 1st Floor 1B: A View from the Summits: The Confluence of Clean Energy Economic and Workforce Development – Rooms 4 & 5, 1st Floor 1C: Green Massachusetts: Policy Check-in – Ballroom A, 2nd Floor |
| 12 :00 | Lunch – 2nd Floor Atrium Poster Session – 2nd Floor Atrium |
| 1 :15 | UMass Alumni Association Alumni Clean Energy Award Presentation and Keynote 2 : Reflections from the National Renewable Energy Laboratory Ballroom A, 2nd Floor Opportunity Fair is CLOSED during Program |
| 2 :15 | Networking Break Poster Session – 2nd Floor Atrium Opportunity Fair is OPEN to the Public – Ballrooms B & C, 2nd Floor |
| 2 :45 | Concurrent Sessions 2 : 2A: Big Time Conservation – Rooms 2 & 3, 1st Floor 2B: When Communities Take the Lead: Green Computing, Solar, Wind, CHP - Rooms 4 & 5, , 1st Floor 2C: Growing Sustainable Communities, Ballroom A, 2nd Floor |
| 4 :00 | Networking Break Opportunity Fair – Ballrooms B & C, 2nd Floor |
| 4 :15 | Concurrent Sessions 3 : 3A: New England Women in Energy & the Environment – Rooms 2 & 3, 1st Fl. 3B: US Green Building Council - MA Chapter – Rooms 4 & 5, 2nd Floor |
| 5 :00 | Conference adjourns |

Program Details

8:00 am – Registration and Continental Breakfast (1st Floor lobby)

Opportunity Fair Opens (Ballrooms B & C, 2nd Floor)

9:00 am – WELCOME (Ballroom A, 2nd Floor)

- **Marla Michel** – Conference Chair, UMass Amherst
- **The Honorable Domenic J. Sarno**, Mayor of Springfield
- **Steve Goodwin**, Dean, UMass Amherst

Opportunity Fair is CLOSED during Program

9:20 am – Keynote 1 (Ballroom A, 2nd Floor)

Developing a Clean Energy Regional Innovation Cluster

Jim Robbins, Business Cluster Development, Founder & Partner

Introduced by Michael Ryan, President, ACTION, Association of Cleantech Incubators of New England

10:20 am – Networking Break (2nd Floor Atrium)

Opportunity Fair Re-Opens (Ballrooms B & C, 2nd Floor)

10:50 am – Concurrent Sessions 1

Session 1A: Ramping It Up: From Marketing to Partnerships (Rooms 2 & 3, 1st Floor)

Cleantech startups are all the rage but what does it take for these companies to get to that next level? Marketing the new company's brand or partnering with large companies with more resources? Either of these can help get innovations to market more quickly.

Moderator: Jef Sharp, Panève, LLC

Speakers:

Michael Mahoney, Saint-Gobain External Venturing

Jonathan Edwards, SmartPower

Session 1B: A View from the Summits: The Confluence of Clean Energy Economic and Workforce Development (Rooms 4 & 5, 1st Floor)

This session (and live-streamed webinar) will be the culmination of a year (+) long project to coalesce clean energy innovators from business, labor, government, academia and community groups to take a snapshot of where we are, share information about our projects, think about strategies and tactics for the future, and re-energize ourselves for the work ahead in support of a robust clean energy industry in Massachusetts. Attendees at this session will hear about the key recurring themes, recommendations, conclusions born from the three summits in Lowell, New Bedford and Amherst, will hear about recent actions taken based on summit discussions, results of those actions and will get a chance to brainstorm next steps as we collectively move forward to build a qualified, skilled and excited workforce for this growing industry.

To view the "Supporting and Growing the Clean Energy Sector in Massachusetts" report, please visit: <http://www.cleanenergycouncil.org/node/6362>.

Co-Moderators:

Said Dini, Western New England University and
Marybeth Campbell, Massachusetts Clean Energy Center

Speakers:

Kevin Doyle, Green Economy
Madeline Snow, UMass Lowell

Session 1C: Green Massachusetts: Policy Check-in (Ballroom A, 2nd Floor)

Landmark legislation was passed in 2008, e.g., the Green Communities Act, putting Massachusetts on the map nationally for accelerating the growth of energy efficiency and the clean energy economy. This session will feature MA officials in an interactive panel to reflect on the progress and challenges our state has faced these past four years.

Speakers:

MA Secretary of Energy & Environmental Affairs, Richard Sullivan

Please note: the Massachusetts House of Representatives and Senate are both in session today precluding these elected officials from partaking in this session.

12:00 pm – Lunch (2nd Floor Atrium) and **Poster Session** (2nd Floor Atrium)

Our Pioneer Valley is home to many institutions of higher education. Faculty and students from UMass Amherst and Western New England University will display posters of their current research and give participants a glimpse into where clean energy technology is headed.

- Building Energy Efficiency at UMass
- MassNanoTech at UMass
- PHaSE Energy Frontier Research Center at UMass
- TIMBR: The Institute for Massachusetts Biofuels Research at UMass
- UMass Wind Energy Center
- Western New England University – College of Engineering – Department of Mechanical Engineering

1:15 pm – UMass Amherst Alumni Association Alumni Clean Energy Award Presentation and Keynote 2 (Ballroom A, 2nd Floor)

Reflections from the National Renewable Energy Laboratory

Walter Musial, National Renewable Energy Laboratory, Principal Engineer

Alumni Clean Energy Award presented by the UMass Amherst Alumni Association and Jim Manwell, UMass Amherst, Professor and Director, UMass Wind Energy Center

Opportunity Fair is CLOSED during Program

2:15 pm – Networking Break (2nd Floor Atrium) and **Poster Session** (2nd Floor Atrium)

Opportunity Fair Re-Opens and is Open to the Public (Ballrooms B & C, 2nd Floor)

2:45 pm – Concurrent Sessions 2

Session 2A: Big Time Conservation (Rooms 2 & 3, 1st Floor)

This session will cover the largest of the commercial and industrial energy conservation projects the Western Massachusetts Electric Company has evaluated. The WMECO customers behind these projects have several things in common: a local conservation "champion," a corporate commitment to reducing energy waste, and an appetite to complete multiple large conservation projects. Yankee Candle will review their campus wide LED lighting project and Trident Alloys will discuss efficiency improvements in large scale process machinery. Another perspective will be provided by the O'Connell Energy Group.

Moderator: Robert Dvorchik, WMECO

Speakers:

Jeff Lubarsky, Yankee Candle

James Galaska, Trident Alloys

Steve Fiske, O'Connell Energy Group (invited)

Session 2B: When Communities Take the Lead: Green Computing, Solar, Wind, CHP (Rooms 4 & 5, 1st Floor)

Several exciting clean energy projects in Western MA are capturing state and national attention. The initiatives discussed in this session will demonstrate how communities are being proactive in deploying cleantech solutions, unleashing the potential of the innovation that can help our economy grow.

Moderator: Brian Beauregard, Holyoke Gas and Electric

Speakers:

Meredith Cochran, representing the Berkshire Wind project

Mayor Michael Tautznik, City of Easthampton, MA

Spiro Vardakas, Aegis Energy Systems

2:45 pm – Concurrent Sessions 2

Session 2C: Growing Sustainable Communities (Ballroom A, 2nd Floor)

Sponsored by: Peoples Bank

Sustainable communities are an integral part of the clean energy economy – housing, jobs, innovation, growth. Several regions in Massachusetts were awarded Regional Sustainability Planning Grants in 2010 by the US Department of Housing and Urban Development, including the Franklin Regional Council of Governments, Metropolitan Area Planning Council, the Berkshire Regional Planning Commission and 2011 Preferred Sustainability Status holder, the Institute for Energy and Sustainability. Panelists from each agency will share how these plans will improve sustainability in Massachusetts communities, what we can learn from the similarities and differences of sustainability planning in each region and how groups and individuals can connect and participate in the planning development..

Moderator: Vincent DeVito, Institute for Energy & Sustainability

Speakers:

Rebecca Davis, Metropolitan Area Planning Council

Peggy Sloan, Franklin Regional Council of Governments

Amy Kacala, Berkshire Regional Planning Commission

4:00 pm – Networking Break (2nd Floor Atrium)

Opportunity Fair Remains Open (Ballrooms B & C, 2nd Floor)

4:15 pm – Concurrent Sessions 3

Session 3A: New England Women in Energy & the Environment (Rooms 2 & 3, 1st Floor)

Session 3B: US Green Building Council – MA Chapter (Rooms 4 & 5, 1st Floor)

5:00 pm – Program Ends

Alumni Clean Energy (ACE) Award

Submit a Nomination

The UMass Amherst Alumni Association has created the ACE Award to recognize alumni who have demonstrated notable achievement or innovation in the far-reaching field of green energy and technologies.

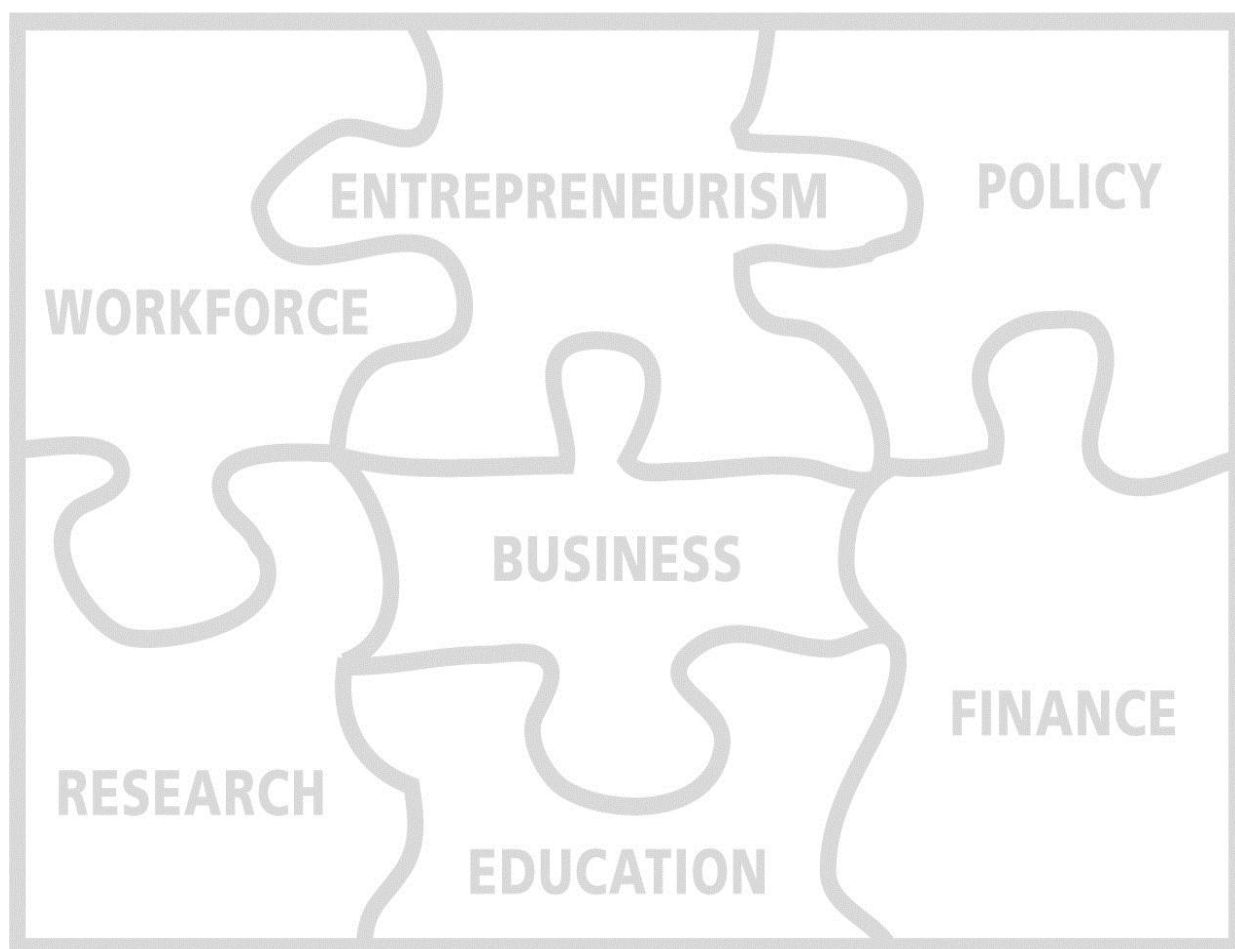
The 2011 ACE Award goes to **Walter D. Musial '80, '83 MS**, principal engineer and manager of Offshore Wind and Ocean Power Systems at the National Renewable Energy Laboratory.

Nominations will be accepted starting in January 2012. Please visit UMassAlumni.com/awards to submit your nomination for the 2012 ACE Award.

UMass Amherst
ALUMNI ASSOCIATION



Speakers' Biographies



Speakers' Biographies

Alphabetical by last name

- Brian Beauregard, Holyoke Gas & Electric
- Marybeth Campbell, Massachusetts Clean Energy Center
- Rebecca Davis, Metropolitan Area Planning Council
- Vincent DeVito, Institute for Energy and Sustainability
- Said Dini, Western New England University
- Kevin Doyle, Green Economy
- Robert Dvorcik, Western Massachusetts Electric Company
- Jonathan Edwards, SmartPower
- Steve Goodwin, UMass Amherst
- Daniel Laduke, Western Massachusetts Electric Company
- Amy Kacala, Berkshire Regional Planning Commission
- Michael Mahoney, Saint-Gobain External Venturing
- Marla Michel, UMass Amherst
- Walter Musial, National Renewable Energy Laboratories
- Chris Noonan, Institute for Energy & Sustainability
- Jim Robbins, Business Cluster Development
- Michael Ryan, ACTION - Association of Cleantech Incubators of New England
- Domenic Sarno, City of Springfield, MA
- Jef Sharp, Panève, LLC
- Peggy Sloan, Franklin Regional Council of Governments
- Madeline Snow, UMass Lowell
- Michael Tautznik, City of Easthampton, MA
- Spiro Vardakas, Aegis Energy Services, Inc.

Brian Beauregard, Holyoke Gas & Electric

As Electric Superintendent of HG&E, Mr. Beauregard supervises all of the Department's electric operations, including distribution, transmission, and operations. Mr. Beauregard has been with HG&E since 1989 as a Cadet Engineer and joined the Department full time in 1992. Prior to becoming Electric Superintendent in 1999, he held various Electrical Engineering and supervisory positions. Mr. Beauregard was responsible for the conceptualization and development of the telecommunications infrastructure, which provides businesses with data and Internet services over fiber optic lines. He has 15 years of experience with managing the Department's power supply portfolio and rate setting. He has a Certificate in Public Utility Management from the Northeast Public Power Association. Mr. Beauregard has received both a Bachelor and Master of Science Degrees in Electrical Engineering from Worcester Polytechnic Institute and a Masters Degree in Business Administration from Western New England University. He lives in Holyoke with his wife Kimberly and their 4 sons ranging in age from 9-14.

Marybeth Campbell, Massachusetts Clean Energy Center

Marybeth Campbell has eleven years experience combined in government, public policy, public education and project management in the energy sector. She is currently the Workforce Development Director at the Massachusetts Clean Energy Center working with higher education, vocational schools, and community based nonprofits and labor to develop training and workforce capacity that supports the Commonwealth's growing clean energy industry. She previously served as the Public Education Manager for Massachusetts Renewable Energy Trust where she oversaw two education initiatives that funded projects to increase awareness among teachers, students and the public about the benefits of clean energy. Prior to joining the Trust, Marybeth worked as a senior research analyst for the Massachusetts House of Representatives Joint Committee on Telecommunications, Utilities and Energy. She has a BA in Political Science from Providence College.

Rebecca Davis, Metropolitan Area Planning Commission

Rebecca Davis is the Government Affairs Manager for the Metropolitan Area Planning Council. Ms. Davis manages the promotion and advancement MAPC's legislative and policy priorities and oversees MAPC's newly created energy division. Previously, she worked in the Massachusetts State House as Legislative Director to State Senator Robert O'Leary, where she worked on the passage of numerous environmental laws, including the Massachusetts Oceans Act, the nation's first ocean management legislation and the Green Communities Act, creating policy to promote energy efficiency and renewable energy development. Ms. Davis has experience working on numerous political campaigns, most recently serving as the Campaign Manager for a Congressional race. Ms. Davis is a graduate of Brown University in Providence, Rhode Island, where she earned a Bachelor of Arts in Public Policy and American Institutions.

Vincent DeVito, Institute for Energy and Sustainability

Vincent DeVito, a former U.S. Assistant Secretary of Energy, currently serves as Director of the Institute for Energy and Sustainability and is also corporate and regulatory attorney with Bowditch & Dewey's Boston office. Mr. DeVito is experienced in renewable energy development and corporate sustainability issues and has closely worked on legislative and regulatory corporate disclosure and compliance matters. Mr. DeVito's clients include utilities, corporations, investors, and entrepreneurs in the clean energy sector.

Said Dini, Western New England University

Dr. Said Dini received his BS in Mechanical Engineering, 1968; his MS in Aerospace Engineering, 1970; both from the University of Missouri at Rolla. In 1972 he joined Iran University of Science and Technology and was promoted to Assistant Professor in the following year. In 1974 he became the Chairman of the Department of HVAC at the University until he returned to Illinois Institute of Technology in 1977. He received his Ph.D. Degree in Mechanical and Aerospace Engineering from Illinois Institute of Technology in 1981. In the same year he joined Western New England University in Springfield, MA as an Assistant Professor. He was the Chair of the ME Department for the academic years 2003-2007. He is presently a professor in the Department of Mechanical Engineering. He is a honorary member of Pi Tau Sigma, The Society of Sigma Xi, Tau Beta Pi, and Who's Who in the East. He has over 44 publications.

Kevin Doyle, Green Economy

Kevin Doyle is Principal of Green Economy, an independent Boston-based consultancy founded in 2007. Green Economy provides labor market research, strategic planning, multi-stakeholder facilitation, program evaluation, and professional training for government, business, academia and the nonprofit community.

Kevin is the workforce program lead for the New England Clean Energy Council and the leader of the Green Careers Affinity Group for the National Fund for Workforce Solutions. His work has been noted by New York Times, Boston Globe, Boston Globe Magazine, Newsweek, Forbes, E Magazine, Marketplace Money, Living on Earth, National Public Radio, Sierra, Outside, Chronicle Channel 5 (Boston) and more. He is co-host of a 2010 "green careers" DVD and is the co-author of four popular books about environmental careers, including The Eco Guide to Careers That Make a Difference: Environmental Work for a Sustainable World and The Complete Guide to Environmental Careers in the 21st Century.

Robert Dvorcik, Western Massachusetts Electric Company

Bob Dvorcik is the Supervisor of Commercial and Industrial Programs of the Western Massachusetts Electric Company. Bob has over 25 years of experience specifically in the field of energy conservation. In the last ten years he has personally overseen 280 conservation projects which are saving WMECO customers over 800,000,000 kilowatt-hours. Bob was responsible for qualifying these customers to receive over \$10,000,000 in WMECO energy efficiency funding. Bob was awarded the title of Certified Energy Manager by the Association of Energy Engineers, and is a graduate of the University of Connecticut. Bob is an active member of the Volunteer Fire Department of New Marlborough, MA.

Jonathan Edwards, SmartPower

Jonathan Edwards has been leading programs, marketing efforts and fundraising for SmartPower since he joined their staff in 2002. Edwards has been responsible for launching many of SmartPower's signature initiatives, including the Clean Energy Communities programs in both Connecticut and Pennsylvania, and leads SmartPower on business development. Under Edwards' marketing leadership, SmartPower has received the U.S. DOE's Green Power Pilot Award and the U.S. EPA's Clean Air Excellence Award.

Edwards has significant experience in both non-profit management and organizational design, having served previously as the founding Executive Director of the Retirement Security Alliance in Washington, DC, Director of Public and Regulatory Affairs for Boston-based Advantage Schools, and one of the original staff persons and regional directors for The Concord Coalition, a deficit watchdog group formed in 1992. Edwards has also served on the campaign staffs of the Paul Tsongas presidential campaign as well as for Congressman John Olver (D-MA).

Jonathan is a graduate of Skidmore College and holds a Master's degree in Public Administration from the University of Massachusetts. In 2004, Edwards was elected to the Whately, MA, Board of Selectmen, where he still serves. Edwards also serves on the Advisory Board for the Sustainable Futures Academy at the Salzburg Global Seminar, is the Chair of the Board of Oversight for the South County Senior Center in Franklin County, and is a Member at Large on the Franklin County Selectmen's Association Executive Committee.

Steve Goodwin, UMass Amherst

Steve Goodwin is the Dean of the College of Natural Sciences at UMass Amherst. He joined the faculty in the Department of Microbiology in 1986 and focused his research on environmental microbiology and the use of microbes to produce biodegradable polymers. He became dean in September 2009.

Dr. Goodwin received a BS in Zoology from the University of Maine, an MS in Environmental Science from the University of Virginia, and a PhD in Bacteriology from the University of Wisconsin. From 2001, Dr. Goodwin served as Dean and as Associate Dean for the former College of Natural Resources and the Environment prior to becoming CNS dean. He is active on the boards of many regional organizations, including Community Involved in Supporting Agriculture (CISA), the Northeastern Regional Association of State Agricultural Experiment Station Directors, and the Pioneer Valley Life Sciences Institute (PVLSI). Steve and his wife Gay are both originally natives of Beverly Mass.

Daniel Laduke, Western Massachusetts Electric Company

Daniel Laduke is a Commercial and Industrial Conservation Project Administrator of the Western Massachusetts Electric Company. In this position he assists WMECO's largest customer in identifying energy conservation opportunities and qualifies these opportunities for Mass Save incentive funding. His previous experience was as an electrical engineer with a focus in design of energy efficient building electrical systems. He is a graduate of the University of Massachusetts where he earned a Bachelor Of Science in Electrical Engineering.

Amy Kacala, Berkshire Regional Planning Commission

Project Manager for the agency's HUD Sustainable Communities Planning Grant at the Berkshire Regional Planning Commission. Manages three related initiatives being linked to the regional plan: the North Adams Comprehensive Plan, the Great Barrington Master Plan and the Keep Farming initiative. Founding member of the region's first Food Policy Council in Northern Berkshire. Works on energy-related projects including Green Communities Act implementation, regional energy planning and climate change mitigation strategies. Also manages BRPC's District Local Technical Assistance grant program and the Indicators portion of the Berkshire Benchmarks program. Works in partnership with social service entities in the region to support initiatives including Teen Pregnancy Prevention Initiative, Early Childhood Education Think Tank and BUW's Community Impact work.

Michael Mahoney, Saint-Gobain External Venturing

Dr. Michael Mahoney is the North American manager for Saint-Gobain's External Venturing group, which identifies and evaluates start-up companies for potential partnerships with Saint-Gobain businesses. Focus areas for the External Venturing group include new products and technologies related to the three pillars of growth for Saint-Gobain: Building Construction, Energy and Environment.

Dr. Mahoney has been with Saint-Gobain since 1995, first as a Research Engineer, then as a Technology Manager in the Abrasives Division. In 2003, he led the technical initiation of a Solid Oxide Fuel Cell group within the Saint-Gobain Research & Development Center near Boston, Massachusetts, USA. He joined the External Venturing group in April 2010.

Dr. Mahoney received a Bachelor's degree in Civil Engineering (1983) and Master's degree in Mechanical Engineering (1985) from the University of Massachusetts Amherst and a Ph.D. in Materials Science from the University of Stuttgart (1992), while working at the Max-Planck-Institute for Solid-State Physics. Following his Ph.D. work, he completed a two-year post-doctoral assignment at Sandia National Laboratories in Albuquerque, New Mexico.

Marla Michel, UMass Amherst

Marla Michel is the Executive Director of Economic Development Strategies and Regional Partnerships at UMass Amherst. In that role, she participates in a variety of regional initiatives where the university can have an impact and works to connect regional leaders to the university, including organizing this annual Clean Energy Connections event. Via a partnership with STCC, she's also the Director of the Scibelli Enterprise Center at STCC and its Business Incubator, growing the area's future businesses and leaders. Prior to these roles, Marla was the director of Research Liaison & Development at UMass, contributing to expanding of the capacity of research and innovation through interdisciplinary initiatives that involved industry, state, and federal partners.

Earlier in her career, Marla worked for AT&T Bell Laboratories as a member of technical staff and then senior marketing manager. One of her more memorable experiences was the development and launch of the original AT&T Smartphone in the early 1990's. Marla received her B.S. degree from the University of Albany – SUNY in Computer Science and Mathematics and her M.S. degree from Monmouth University in Software Engineering.

Walter Musial, National Renewable Energy Laboratories

Walt Musial is a principal engineer and the manager of Offshore Wind and Ocean Power Systems at National Renewable Energy Laboratory (NREL) where he has worked for 23 years. He initiated the offshore wind energy research program at NREL in 2003 and has written many papers, reports and articles on offshore wind energy. For over 7 years he has been the primary technical contact to the Department of Energy on offshore wind. Recently he served on a committee to the National Academy of Science which wrote a report titled “Structural Integrity of Offshore Wind Turbines” which was published in 2011. Before NREL, Walt was employed in the commercial wind energy industry in California. He studied Mechanical Engineering at the University of Massachusetts at Amherst, where he earned his Bachelor’s and Master’s Degrees and specialized in all aspects of renewable energy and energy conversion with a focus on wind energy. He has over 50 publications and one patent.

Chris Noonan, Institute for Energy & Sustainability

Mr. Noonan serves as the Senior Program Advisor for IES and specializes in urban sustainability and participatory management. At IES he manages a growing client list of market ready companies and key portfolio projects in areas including smart grid technologies, electric vehicles, renewable energy, and sustainability planning. Chris received an MA in Environmental Science and Policy from Clark University. He serves on National Grid's Smart Grid Advisory Committee and as clerk on the Board of Directors for ACTION.

Jim Robbins, Business Cluster Development

Jim Robbins founded Business Cluster Development (BCD) in 1993. BCD has helped over 60 organizations with the formation of sector-focused incubators, regional innovation clusters and technology commercialization centers. A few current BCD projects include developing a regional innovation strategy for Lawrence Berkeley National Lab in Berkeley, CA; a radio frequency identification (RFID) incubator in Dayton, OH; and clean tech innovation and demonstration clusters in Los Angeles and San Jose, CA. BCD is also active in international economic development, including projects in Uganda, Nigeria, Senegal, China, and Japan.

After 15 years, Jim retired as Executive Director of the San Jose Environmental Business Cluster (EBC) in January, 2009. The EBC was the first environmental incubator in the U.S. when Jim founded it in 1994, and it was named the top incubator in the nation by the National Business Incubation Association in 2008. The EBC specializes in technology commercialization of clean and renewable energy technology, and it was selected as the top clean tech commercialization center in a world-wide study of 110 centers in late 2007.

For five years, Jim was a Principal in Panasonic Ventures, a \$100 Million dollar investment fund, and he works with several clean tech venture forums each year. Jim was also the Chairman of the Board of Directors of the National Business Incubation Association (NBIA) in 2006, and he teaches a course on how to start successful incubators and technology clusters twice yearly for NBIA.

Jim has almost 40 years' experience in the fields of new business formation, organizational design and management, technology development and commercialization, environmental technology, business operations and law. In addition to founding Business Cluster Development, he has worked for Digital Equipment Corporation, as the West Coast Business Manager where he assisted with the start-up of 25 engineering and research groups, and at the U.S. Supreme Court, where he introduced computer technology and modernized the management structure. Jim was also a trial attorney for ten years. He is a frequent speaker on technology innovation clusters, early stage venture funding, clean technology, and industry-focused incubation. Jim has also participated in case studies of BCD incubators by Harvard and Stanford Universities.

Michael Ryan, ACTION - Association of Cleantech Incubators of New England

Mr. Ryan is Co-Founder of the Association of Cleantech Incubators of New England (ACTION). He assumed leadership of the non-profit organization in January 2011, was elected President and to the Board of Directors in March 2011 and expanded the Board in June 2011 to include 7 other participating Members and organizations. Mr. Ryan has led ACTION through its incorporation while participating in the Department of Energy funded Innovation Ecosystem Program, U-Launch, as well as being a key contributor to the capture of the i6 Green Challenge grant from the Department of Commerce in September 2011. Additionally, Mr. Ryan is Founder and President of a privately held technology development and commercialization company, Accelerate Inc.

Prior to forming ACCELERATE Inc, Mr. Ryan worked for over 25 years in a variety of operations, technology and consulting roles, with increasing levels of leadership and responsibility at firms such as Affymetrix, Genetic MicroSystems, Coopers & Lybrand Consulting, Bose Corporation and General Electric. Prior to initiating his civilian career, Mr. Ryan served as an officer in the U.S. Navy aboard USS Wainwright (CG28). Mr. Ryan received a BS in Industrial and Management Systems Engineering from The Pennsylvania State University and his MBA from Bentley College.

Domenic Sarno, City of Springfield, MA

Mayor Domenic J. Sarno, a native son of the City of Springfield, has earned a reputation for his commitment to community-based programs to address quality-of-life issues, education and public safety. A former four-term City Councilor who served as City Council President and as a member of the Springfield Finance Control Board, Sarno was elected Mayor on November 6, 2007. Sarno is a graduate of the High School of Commerce, where he excelled as an athlete and scholar. He was elected class president as a freshman and junior and named to All Western Massachusetts in soccer and All City League in baseball. He attended American International College as a political science major and holds a bachelor's degree in psychology from Westfield State College, where he was inducted into the National Honors Society. Sarno served as a mayoral aide under Mayor Mary Hurley from 1989 to 1991 and worked with District Attorney William Bennett from 1996 to 2002. He served as executive director of the South End Community Center from 2002 until his election as Mayor.

Jef Sharp, Panève, LLC

Jef is the President of **Panève**, LLC, and is a serial entrepreneur. He co-founded Qteros in 2006 and led the biofuels company as CEO from a start-up through Series B funding. He also managed marketing, public relations, branding, communications, and government affairs and is currently on the Board of Directors. Jef is co-founder of Jattra Ventures and TechCavalry and has led many innovative businesses, including XSCapacity, an online exchange for more efficient use and distribution of excess manufacturing capacity and Gravity Graphics, an Inc. 500 company he started from scratch while getting his degree at the University of N.H. He has received numerous awards for entrepreneurship, including New York State's Small Business Person of the Year award. Jef is currently on the Panève Board of Directors.

Peggy Sloan, Franklin Regional Council of Governments

Peggy Sloan is the Director of Planning & Development for the Franklin Regional Council of Governments (FRCOG) and has worked extensively over the last 18 years on land use, clean energy, housing, natural resource, and economic development issues at the regional and local level including the creation of the Pioneer Valley Clean Energy Plan. In addition, she is responsible for the FRCOG's Brownfields program including a \$1 million Revolving Loan Fund sponsored by the EPA which has resulted in the assessment or clean-up of 42 sites in 15 towns over the last ten years.

Ms. Sloan graduated from Smith College where she majored in economics and minored in biology. Her undergraduate education was followed by six years of work in commercial and investment banking where she specialized in project financing for large-scale natural resource, energy, and infrastructure projects. She returned to graduate school where she obtained Masters Degrees in Regional Planning and Landscape Architecture from the University of Massachusetts in Amherst. Since graduate school she has worked as a regional planner on Cape Cod and in her current position. Ms. Sloan serves as the Project Manager for the HUD Sustainable Communities Regional Planning grant.

Madeline Snow, UMass Lowell

Madeline is Director of the EMS Service Program in the Lowell Center for Sustainable Production at the University of Massachusetts Lowell. An experienced trainer and facilitator, she works with a wide variety of organizations to improve sustainable practices, environmental compliance, and energy management. She is also working on workforce development in the clean energy sector as well as the water and wastewater sector. She holds a B.A. in Biology and Environmental Studies from New College of Florida and an M.P.A. from the Harvard Kennedy School.

Michael Tautznik, City of Easthampton, MA

Michael A. Tautznik was elected as the first Mayor of the City of Easthampton in July of 1996. In the successive elections since then, Mike has demonstrated his unique capacity to lead the community and remains the only Mayor to have ever served in Easthampton. He is a life-long resident who has dedicated his time and energy to the city and its citizens for more than 34 years. He was an elected member of the legislative Town Meeting, serving from 1977 until its dissolution in 1996, and he served as a member and as Chairman of the Easthampton Board of Selectmen from 1989 to 1996.

Since taking the oath of office as Mayor in September 1996, Mike has worked diligently to lay the foundation for a successful transition of government, attentive to the regional economic development issues, and a strong advocate for clean energy and sustainable communities.

Spiro Vardakas, Aegis Energy Services, Inc

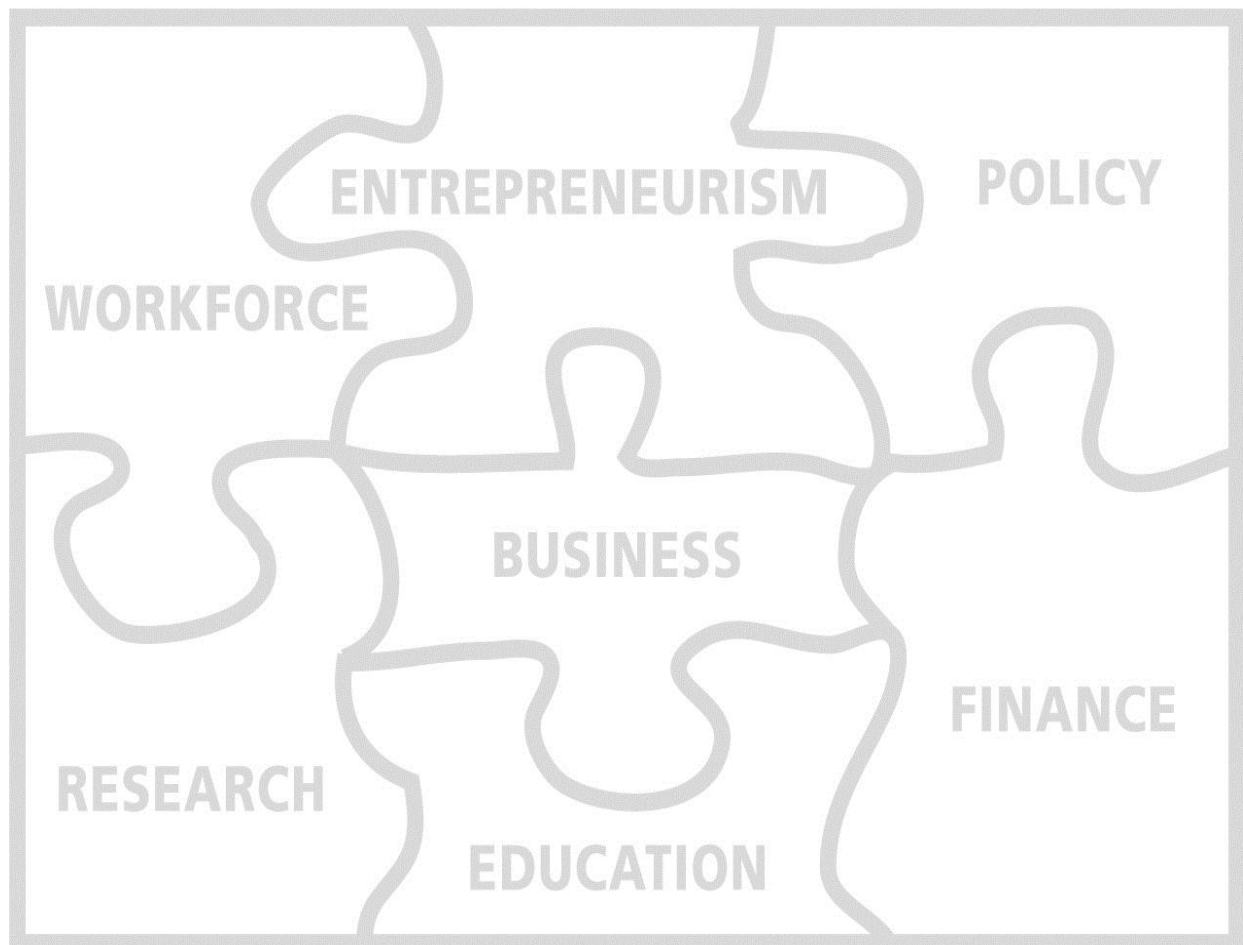
Spiro Vardakas, founder and President of Aegis Energy Services Inc., continues to provide hands-on leadership today, 26 years after the company's founding.

Prior to launching Aegis Energy Services, Mr. Vardakas had extensive Utility experience in commercial and industrial sales, and as a management consultant. His focus was large utility customers and energy application/conservation related to space conditioning, illumination, and industrial processes.

Recognizing the potential of Combined Heat and Power technology, especially in light of increasing energy prices, Mr. Vardakas launched Aegis Energy Services in 1985, as a solution to rising energy costs, and has shepherded the company to its position as the leader in small, modular CHP market in the Northeast.

Mr. Vardakas is often asked to speak at CHP industry events and has testified at numerous utility rate cases, and commission policy hearings, for development of the CHP market. He holds a Bachelor of Science in Management and Mechanical Engineering from Rensselaer Polytechnic Institute. His publications include ASHRAE Use of CT Weather Data for calculating energy use on an hourly basis.

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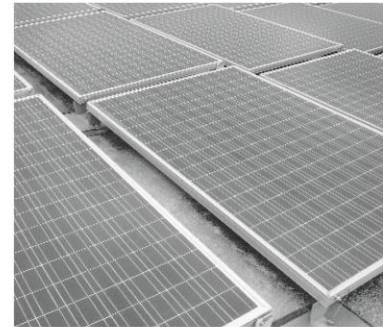
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Employing over 800 people in technology-related businesses in a 15-acre business park, infusing \$2.5 million into the local economy and over \$180,000 in annual real estate taxes.



Green is not just another color at Springfield's Technology Park. The Park was an early adopter of facility management practices that are energy efficient and that promote sustainable business practices.

The most visible sign of sustainability is the solar panel array that provides renewable energy to the Park and its tenant organizations. By doing so the complex is reducing its carbon footprint while setting an example of how technology can contribute to a new economic landscape in the future.



The Park is also a great location for new or emerging green businesses and possesses LEED Certified staff.

Other energy efficiencies in the operation may not be as obvious – automated building control systems creating efficiencies and reducing energy costs, vendors being evaluated for their "green" credentials and the utilization of green cleaning practices – all making for a forward-looking, and acting, environment.



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Since 1999, the Scibelli Enterprise Center at STCC has been providing **ADVICE, SPACE, CONNECTIONS, INSPIRATION, & TRAINING** to entrepreneurs and small business owners from our regional community. Hundreds of companies have used our services and more than two dozen businesses have benefitted from being Business Incubator clients, receiving personalized mentoring from respected area business leaders.

The Scibelli Enterprise Center offers much more than just nice office space. Pre-revenue companies can use our well-appointed conference rooms up to four times per year for free. Businesses can utilize our fabulous set of support services for training or confidential counseling, including the MA Small Business Development Center, NEBA Business Consulting Center, SCORE, and the US Small Business Administration. Clients and tenants can network and get advice at one of our regular Pizza Lunches. Parking, 24/7 security, utilities, and use of the shared workroom are all included in our reasonable monthly rate.

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28% percent of UMass Amherst faculty researchers are engaged in sustainability research.



52% of academic departments that conduct research have at least one faculty member engaged in sustainability research.



The campus received a Gold rating in 2011 by the American Association of Sustainability in Higher Education (AASHE) for its sustainability achievements in research, education, administration and operations.

What makes us Gold?

Biofuels

- ☆ The Department of Energy awarded \$800,000 to chemical engineering Professor Paul Dauenhauer to further develop efficient processes for using wood biomass to produce **high-quality bio-oil for green gasoline**.
- ☆ **The Institute for Massachusetts Biofuels Research (TIMBR)** develops advanced bio renewable fuels and chemicals. TIMBR's 28 scientists in 12 different labs partners with academic institutions and industry to facilitate rapid technology transfer.
- ☆ Professor Danny Schnell and colleagues are using a \$1.5 million U.S. Department of Energy **PETRO grant** (Plants Engineered to Replace Oil) to develop an improved biofuel crop leading to production of biofuels at half their current cost, making them cost-competitive with petroleum-based fuels.
- ☆ **Biofuels spinoff** company, Qteros, founded by microbiology Professor Susan Leschine is headquartered in Marlboro, Mass. and recently opened a \$3.2 million biomass-to-ethanol conversion pilot plant in Chicopee, Mass.

Economy

- ☆ Studies by economics Professor Robert Pollin and colleagues at the Political Economy Research Institute provide a fresh “greenprint” for national recovery. Research shows that **investing in clean energy** such as wind power, solar and biofuels will triple good-paying jobs (over conventional projects).

Climate and the Environment

- ☆ UMass Amherst is the lead institution for the **Northeast Regional Climate Science Center**. This \$7.5 million center funded by the U.S. Department of the Interior will provide scientific information, tools, and techniques that land, water, wildlife and cultural resource managers can apply to anticipate, monitor and adapt to threats and changing conditions posed by the changing climate.
- ☆ The UMass **Center for Agriculture** conducts research on sustainable energy, climate change, and environmental stewardship.

Renewable energy

- ☆ **Massachusetts Center for Renewable Energy Science and Technology (MassCREST)** where researchers from 5+ departments use expertise in soft materials and in soft-hard material interfaces to develop efficient solar cells and fuel cells, produce hydrogen from water using enzymes, and catalysts for the conversion of biomass to hydrocarbon fuel (biofuels).
- ☆ **PHASE: Energy Frontiers Research Center** created by a \$16M grant from the Department of Energy seeks to extend the range of the light spectrum usable as energy by photovoltaic cells, increasing efficiency in energy generation and storage.
- ☆ **UMass Amherst Wind Energy Center** founded in 1972 is the oldest and most well-known energy education program offering master's and doctoral-level degrees in the U.S. The program boasts over 200 graduates, many of whom now hold senior level positions in industry and national research centers, and in 2011 launched the first wind energy graduate certificate program in the U.S.
- ☆ The **Offshore Wind Integrative Graduate Education and Research Traineeship (IGERT)** established by a \$3.2 million National Science Foundation grant provides training in technology, environmental implications, and social/economic/regulatory challenges of offshore wind farms.

UMassAmherst

The NSF funded National Center for Information and Communications Technologies (ICT) at STCC is recognized nationally as a leader for its expertise in developing and distributing comprehensive ICT content supporting business and industry's efforts to educate and train the ICT workforce.

The ICT Center incorporates emerging technologies in which the creation, storage and movement of information is of critical importance and is a key resource for developing and securing appropriately-skilled ICT technicians and technologists.



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Holyoke Clean Energy Innovation Workshop Energy Innovation, Technology, Policy and Testbeds in Holyoke

November 9,10 2011

Open Square Mill #1, 1 Open Square, Holyoke MA

What is the Clean Energy Opportunity in Holyoke?

Holyoke possesses a unique energy asset with its utility – Holyoke Gas & Electric (HG&E). As compared to other communities in Massachusetts and most of the northeast, Holyoke has some of the lowest electricity costs with an excellent record of reliability, primarily due to hydroelectric power generated by the Hadley Falls dam and the Holyoke canal system. According to HG&E's annual report, hydroelectric power generates 276,185 MWh per year providing 73% of its electricity demand from its own renewable hydropower.

HG&E's uniqueness as a municipal utility extends beyond that asset: 1) they are committed to expanding their portfolio of low-cost, clean energy resources in Holyoke and beyond; 2) they own significant fiber optic network infrastructure for telecommunications, internet, and other functions; and 3) they are committed to innovation and working with leading providers of energy-related products and applications.

With this innovative municipally-owned utility, the presence of ISO-New England, the emergence of innovative clean energy technologies, a talented workforce, a blossoming entrepreneurial environment, broad academic research and education capabilities, and an engaged public and private sector - Holyoke and the Connecticut River Valley region are well-poised to help create, deploy, and leverage the next generation of clean energy system technologies.

Key to success, however, will be collaboration among engineers, entrepreneurs, policy makers, researchers and educators with the ability to learn from, and leverage, everyone's expertise. The workshop will be the basis for sparking new collaborations across industry, academia and government. Participants are encouraged to use the workshop as a forum for looking out 12-18 months with ideas for collaboration, partnering and implementation. In this way Holyoke and the Pioneer Valley become the nexus and test bed for the development of innovative energy research, technologies, products, systems and solutions.

The goal of the workshop is to discuss and identify test-bed opportunities in Holyoke and begin to develop connections and collaborations among industry, academic, and policy stakeholders through learning about one another's capabilities and portfolios of clean energy activity. Anticipated outcomes could relate to identifying opportunities for collaboration on federal-funding partnerships (DOE, NSF, etc.), investment, entrepreneurial endeavors, and research and educational activities in the clean energy space.

More Information is available at www.cs.umass.edu/energy_innovation_workshop

ACTION

Association of Cleantech Incubators of New England

The Association of Cleantech Incubators of New England (ACTION) is New England's leading network of cleantech incubators sharing the common goals of accelerating the growth and success of early-stage companies, strengthening the regional cleantech cluster, and creating more green jobs in New England.

ACTION is a nonprofit organization. Our network of incubators provides diverse resources and a highly-supportive hub in which entrepreneurs, business leaders, government agencies, community leaders, investors, universities, and other interested organizations can collaborate toward the successful commercialization of enterprises that will build a prosperous green economy, improve the quality of our lives and sustain the health of our environment.

ACTION's mission is to accelerate the success of early-stage cleantech entrepreneurs that are supported by our membership of incubator organizations. Through the comprehensive ACTIONNetwork of New England based incubators, we are dedicated to providing cleantech startups with a variety of support services that include the use of specialized technical facilities for R&D, subsidized office space and administrative support, research and patent collaboration, quality business mentoring and professional services, and potential funding opportunities to facilitate commercialization. The breadth and diversity of our incubator network offers entrepreneurs a diverse hub of knowledge, experience, and resources that is most often unavailable from a single incubator organization.

For more information on ACTION Membership, Partnership or Sponsorship, please contact ACTION President, Michael Ryan at: mryan@actionnewengland.org, Tel. 508-277-5211.

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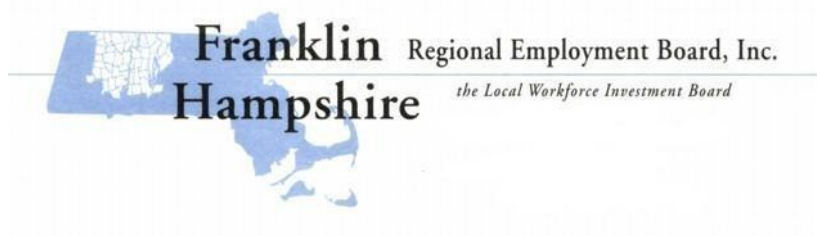


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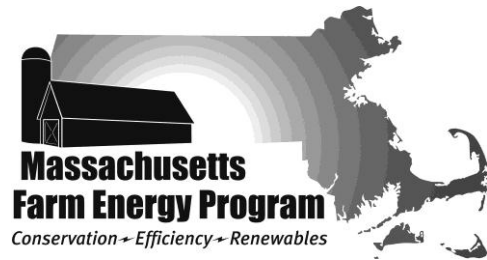
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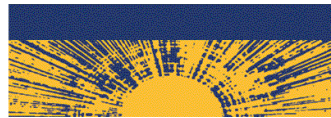


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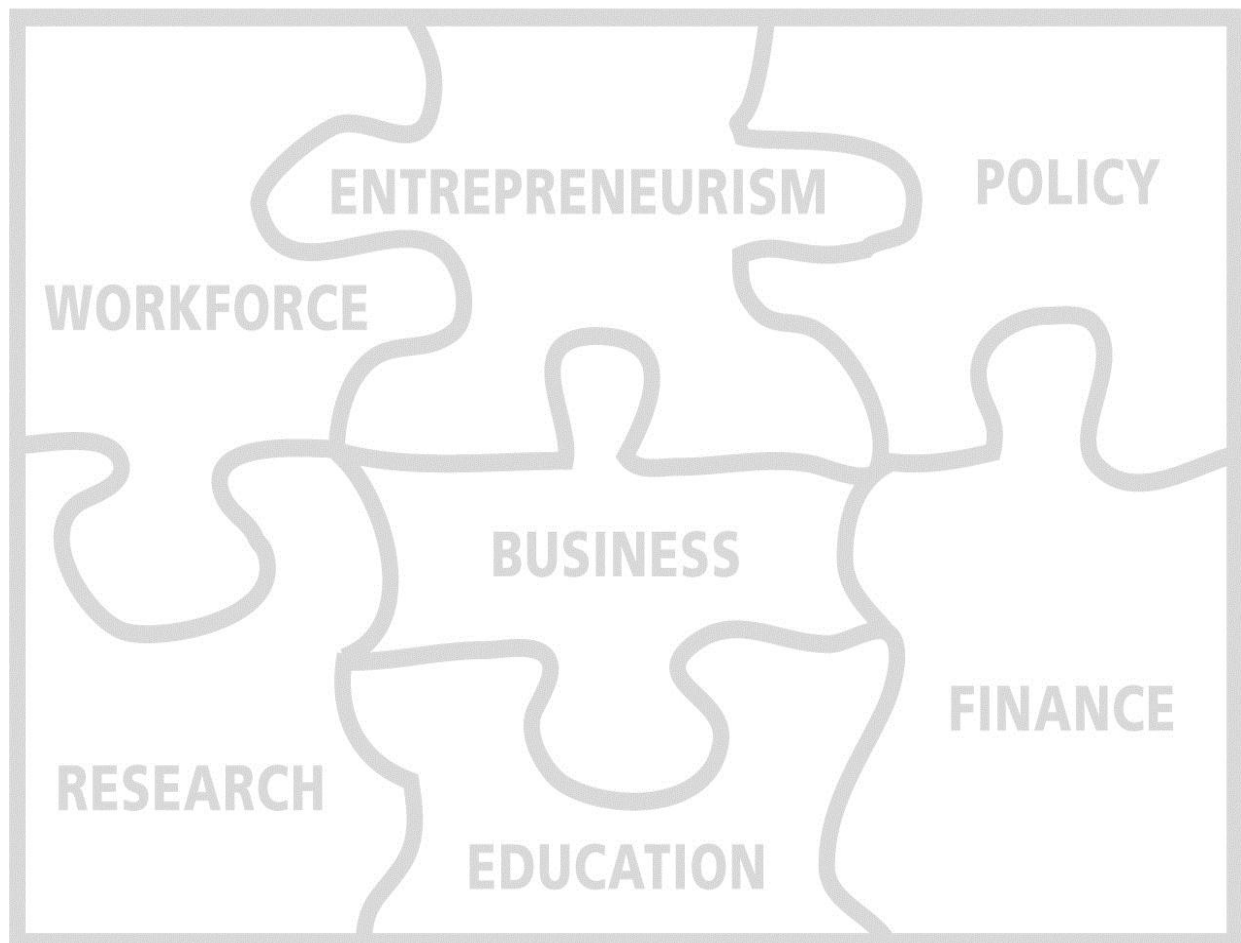


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- Holyoke Community College
- Marlboro College - MBA in Managing for Sustainability
- Springfield Technical Community College
- UMass Amherst, Center for Agriculture
- UMass Amherst Sustainability Initiatives
- UMass Amherst University Without Walls
- UMass Amherst Wind Energy Center
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www.aegisenergyservices.com

Aegis Energy Services is a turn-key, full service provider of Combined Heat and Power systems (CHP) that generate heat and electricity using clean, efficient natural gas powered engines. These modular CHP systems will reduce your facility's dependence on expensive utility power, reduce energy costs and reduce your carbon footprint.

For over 25 years, our CHP systems have a proven track record of cost cutting, energy savings and carbon emission reductions in facilities such as apartment buildings, assisted living and retirement facilities, industrial complexes, college dormitories, hotels, health clubs, and nursing homes. Facilities that have implemented our systems frequently experience a 2-4 year simple payback.

Alteris Renewables, A Real Goods Solar Company

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Real Goods Solar is a leading solar energy integrator, having installed over 11,500 solar electric systems for homes, schools and businesses. We offer turnkey solutions, and have 33 years of experience in solar energy, beginning with its sale of the first solar photovoltaic panels in the U.S. in 1978. With 15 offices in California, Colorado and the Northeast, Real Goods Solar is one of the largest solar installers in the country. For more information, visit www.RealGoodsSolar.com or call 1-888-56-SOLAR.

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Applied Proactive Technologies, Inc. promotes energy efficiency programs for electric utility companies throughout the United States. We help increase consumer demand for ENERGY STAR qualified products through multi-faceted outreach campaigns. Most notably, we promote the use of ENERGY STAR qualified lighting and appliance products. Our efforts are conducted primarily in partnership with retailers and manufacturers.

The Energy Conservation Training Company specializes in training and certification programs for energy auditors, weatherization workers, and home performance contractors. Our blended training system combines hands-on field training with classroom instruction and online curriculum. We offer BPI certification prep courses, BPI written & field exam proctoring, and PTCS duct sealing technician training and certification courses.

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Since 1985, Berkshire Photovoltaic Services has designed & installed hundreds of Photovoltaic Systems. Our mission is to provide safe, efficient and durable PV systems. We favor photovoltaic components manufactured in our region to support the local economy and because these modules, mounts, and power electronics are the best in the world. BPVS is fully licensed (MA HIC 131996) and insured for commercial, institutional and residential PV Systems. All of our installations are fully permitted and approved. BPVS has helped pave the way for PV acceptance by installing the first solar electric systems in over 90 jurisdictions and several utility territories.

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www.csrwire.com

newswire focusing on news with social responsible initiatives

CSRwire is the leading global source of corporate social responsibility (CSR) and sustainability news. Founded in 1999 to advance the movement towards a more economically-just and environmentally-sustainable society and away from single bottom line capitalism, CSRwire has paved the way for new standards of corporate citizenship, earning the international respect of thought leaders, business leaders, academics, philanthropists, activists and the media community. Through innovative techniques and strategic partnerships, CSRwire continues to expand its content, communication technology and distribution channels exponentially.

Dennis K. Burke, Inc.

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Dennis K. Burke is one of the Northeast's leading suppliers of premium diesel, motor oil and gasoline. Celebrating their 50th anniversary, the Massachusetts-based fuel distributor services wholesale, retail and government accounts in eleven states, with terminal positions in seven states.

The family business is at the forefront of the biofuels industry. Dennis K. Burke is renowned throughout the region for years of hands-on experience in the emerging biodiesel industry. With over a decade of blending and delivering biodiesel experience, the fuel distributor is a well-known proponent for biodiesel, bioheat and E85 ethanol.

Green Monster eCycling

www.GreenMonsterEcycling.com

computer, electronics recycling

Green Monster e-Cycling was founded in 2007. Founder, Joe Galiatsatos, realized that tons of electronics were packing landfills locally, or being exported in an unsafe manner, so he took the initiative to do something about it. Green Monster has a zero-landfill policy and abides by the strictest guidelines set forth by the EPA to de-manufacture, sort and recycle end-of-life electronics and in the safest and most ethical manner. Each year Green Monster has been able to at minimum triple the amount of electronics recycled, preventing toxins from making their way into our environment, as well as putting precious resources back in to use for newly manufactured products.

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Hyperion Systems

www.HyperionSystemsLLC.com

solar, photovoltaic, agriculture, renewable, electric

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www.bankatpeoples.com

PeoplesBank has a passion for making the Pioneer Valley a better place to live, work, and raise our families. Our focus is on providing innovative financial products, support for the community, and the personal commitment it takes to make things possible.

PeoplesBank is the largest mutually chartered bank in western Massachusetts and a leader in green values, sustainable energy financing, and charitable giving. Founded in 1885, the bank takes its responsibility to the environment seriously and has financed more than \$35 million in wind, hydroelectric and solar energy projects in recent years. In addition to its LEED registered office in Springfield, PeoplesBank will build green offices in Northampton and West Springfield in the near future. PeoplesBank – a passion for what is possible.

ReKnew Energy Systems, Inc.

www.ReKnewEnergy.com

solar, electric, photovoltaic, renewable, energy

ReKnew Energy Systems designs and installs solar throughout Massachusetts, Vermont, and New Hampshire. We provide solar hot water and solar electric (PV) for homeowners, businesses, non-profits, schools, and municipalities. We design energy systems that precisely fit your budget and energy needs. We can help you with incentives, rebates, and solar renewable energy credits (SRECs). ReKnew has an exclusive partnership in the SREC market which allows us to offer you the best options so you can start getting a check for your energy production today! Ask for a free site visit and we can help you turn the sun into money!

Rodman & Rodman, CPAs

www.rodmancpa.com

renewable energy tax credits, green accounting, greentech financial strategies, GreenTech grant assistance, GreenTech tax advisory

The Rodman & Rodman “Green Team” is dedicated to providing alternative energy producers, and other businesses that pursue energy efficiency initiatives, with expert counsel and services in green energy tax accounting and business strategy. Our experienced “Green Team” CPAs are domain experts in alternative energy finances, offering tax advisory, financial and accounting services for cleantech companies involved in solar, wind, biomass, and energy efficiency projects. We can provide your company with a sustainable financial roadmap through: expert partnership/corporate structuring for optimal tax benefit; grant qualification assistance and auditing; ongoing advisory services for federal, state and local tax incentives; and specialized strategic financial planning and management for alternative energy companies.

Sandri Energy

www.sandri.com

Sandri is a full service energy provider for home or business. A family owned business for the last 80 years, our direct service area encompasses Western MA and Southern VT and NH. We wholesale our products throughout the North East. Our staff of energy experts is able to meet all your heating, cooling & indoor air quality needs. We offer a wide range of products and services including: Solar Hot Water, PV, High-Efficiency Wood Pellet Boilers, Wood Pellets, Heating Fuels, Indoor Air Quality and full professional HVAC installation and repair. Put Sandri's energy experts to work for you! 1-800-628-1900

Stiebel Eltron

www.stiebel-eltron-usa.com

solar thermal, instant hot water, heat pump hot water, clean technology, German innovation

Stiebel Eltron is as German manufacturer of solar thermal collectors and storage tanks. Partnering with PAW, a provider of pump stations, and with RESOL controls we provide OG-300 rated SOLKIT packaged complete solar domestic hot water kits. Stiebel Eltron is also an industry leader in tankless electric water heating technology, having pioneered the concept of the tankless hot water heaters in Europe. Over our 80 year history we have established a strong reputation for manufacturing highly reliable tankless products. Stiebel Eltron has point-of-use and whole house models from 3.0 kW to 36 kW.

Sun Energy

www.sunenergy-northeast.com

Solar thermal systems sales service

Saving the planet, one shower at a time.

Sun Energy sells, installs, and maintains solar domestic hot water systems and solar pool heating systems. The company has installed 594 domestic hot water and 62 pool systems in the Berkshires, western MA, eastern NY, and southern VT since it started in 1978. Sun Energy strives to sell and install American-made components whenever possible. Sun Energy also services all brands of solar hot water and pool systems. The company currently has 1,150 service customers. Jim Sherratt has owned the company since 1993. Licensed and insured. Estimates are always free.

TechniArt, Inc.

www.techniart.com

Located in Connecticut, TechniArt is an ENERGY STARR partner and energy-efficient lighting promoter and seller. They are sponsored by utilities and energy programs throughout the Northeast, bringing Energy Saving Lighting Fairs to area businesses, state agencies, colleges/universities, and municipalities.

Western Massachusetts Electric Company

www.wmeco.com

Western Massachusetts Electric Company, commonly known as WMECo, is a main distributor of electricity in western Massachusetts, serving more than 200,000 customers. We continuously work hard to bring you the best possible service, while providing a safe environment for you and your family. We also are dedicated to maintaining an electrical system to meet your growing needs, where electricity has become an integral part of our everyday lives.

Organizations:

ACTION – Association of Cleantech Incubators of New England

www.actionnewengland.org

cleantech incubators, entrepreneurs, collaborative cleantech network, cleantech cluster

The Association of Cleantech Incubators of New England (ACTION) is New England's leading network of cleantech incubators sharing the common goals of accelerating the growth and success of early-stage companies, strengthening the regional cleantech cluster, and creating more green jobs in New England.

ACTION is a nonprofit organization. Our network of incubators provides diverse resources and a highly-supportive hub in which entrepreneurs, business leaders, government agencies, community leaders, investors, universities, and other interested organizations can collaborate toward the successful commercialization of enterprises that will build a prosperous green economy, improve the quality of our lives and sustain the health of our environment.

Affiliated Chambers of Commerce of Greater Springfield

www.myonlinechamber.com

The Affiliated Chambers of Commerce of Greater Springfield, Inc. promotes the industrial, commercial, civic and cultural welfare of the Greater Springfield area, works to encourage and support local businesses and to assist in attracting and securing the location of new businesses within the area to the end result that the Greater Springfield area shall be more prosperous, healthy and in all respects a more desirable place to work and live.

Building Performance Institute, Inc.

www.bpi.org

standards, certification, accreditation, quality assurance, energy efficiency

The Building Performance Institute, Inc., (BPI) is the nation's premier building performance credentialing, quality assurance and standards setting organization. BPI develops technical standards using an open, transparent, consensus-based process built on sound building science. BPI is approved by the American National Standards Institute, Inc. (ANSI) as an accredited developer of American National Standards.

BPI offers:

- National standards to ensure top quality, consistent protocols are being followed throughout the home performance workforce
- Certification of individuals
- Accreditation of contracting companies
- A third party Quality Assurance verification program
- Affiliation of testing organizations delivering BPI services in their market

Cleantech Open – Northeast

www.cleantechopen.com

The Cleantech Open is the leading business accelerator program and business competition for cleantech startups worldwide. We believe the most critical challenges facing the world today, related to energy, environment and the economy, represent strategic opportunities for breakthrough innovation and job creation. We provide the platform to find, fund and foster entrepreneurs that address these most urgent energy, environmental and economic challenges. Our network of professionals and alumni work collaboratively with visionary entrepreneurs to create measurable environmental impact and a better world.

Coop Power

www.cooppower.coop

energy conservation, solar power, just, sustainable

Co-op Power is a regional network of local communities creating a multi-class, multi-racial movement for a sustainable and just energy future. We are a consumer-owned energy cooperative serving New England and New York. Co-op Power's Local Organizing Councils include Co-op Power Metro East (greater Boston), Co-op Power Franklin County, Co-op Power Hampshire County, Co-op Power Hampden County, and Co-op Power of Southern VT.

Economic Development Council of Western MA

www.westernmassedc.com

The Economic Development Council of Western Massachusetts (EDC) is a business created development corporation that brings the region's public and private sector leaders together to expand economic opportunity in Hampden, Hampshire and Franklin counties. Affiliated with seven independent western Massachusetts economic development organizations, the EDC provides a broad array of services to prospective businesses and organizations interested in the area, as well as those already here who are expanding, helping them find capital and networking resources to stimulate business expansion. Affiliates include the Affiliated Chambers of Commerce of Greater Springfield, Inc.; Business Improvement Districts in Springfield, Westfield and Northampton; Greater Springfield Convention and Visitors Bureau; Westmass and Westover Metropolitan Development Corporation.

Franklin Hampshire Regional Employment Board / Northern Tier Energy Sector Partnership

www.franklinhampshirereb.org

green job training, Western Massachusetts, renewable energy jobs, energy efficiency jobs, weatherization jobs

The Franklin Hampshire Regional Employment Board is the region's policy-making authority in developing workforce skills. In partnership with government, business, labor, education and CBOs, the FHREB coordinates and oversees the region's publicly funded workforce training and placement programs, including One Stop Career offices in Northampton, Greenfield and Orange. The Board's mission is to shape, nurture and sustain a regional workforce development system responsive to business and job seekers alike. The FHREB currently leads the Northern Tier Energy Sector Training Partnership, a collaboration of three area Workforce Boards working with green business and education partners to train and place 90 individuals into green jobs by December 2012.

The Northern Tier Energy Sector Partnership (NTESP) is a US Dept. of Labor ARRA-funded green job training program administered by the Franklin Hampshire Regional Employment Board (FHREB). It is designed to fund energy efficiency and renewable energy training for at least 96 unemployed and under-employed and incumbent worker adults in Franklin, Hampshire, Berkshire and Northern Worcester counties and to place at least half of them in employment by December, 2012. NTESP is a partnership between community colleges, workforce boards and green employers in the Northern Tier region. For more information, visit and "like" the NTESP Facebook Page

Mass Clean Energy Center / DOER

www.masscec.com

Energy plannings, energy efficiency, business assistance

Creating a Greener Energy Future for the Commonwealth - economically and environmentally, including:

- Achieving all cost-effective energy efficiencies
- Maximizing development of greener energy resources
- Creating and leading implementation of energy strategies to assure reliable supplies and improve relative cost
- Supporting clean tech companies and spurring clean energy employment

DOER is an agency of the Executive Office of Energy and Environmental Affairs (EEA). Energy efficiency is a proven investment for small and large businesses, industry, hospitals, schools, and other organizations. It can decrease costs, reduce energy pricing risks, engage your employees, and demonstrate responsible business practices. Since it costs a fraction of the price of generating power, it's now our "first fuel."

MassGREEN Initiative

www.massgreentcc.com

weatherization installer training, weatherization crew chief training, clean energy training, BPI certification, weatherization training centers

The MassGREEN Initiative at Springfield Technical Community College, in partnership with the state's other community colleges, develops and delivers comprehensive energy efficiency workforce training courses to meet the region's growing need for weatherization and clean energy professionals. These courses provide basic to advanced weatherization installer skills training through classroom and intensive hands-on applications, weatherization crew chief training, and assist entrepreneurs interested in starting their own weatherization contracting business. MassGREEN is also an approved BPI Training Affiliate.

Massachusetts Office of Business Development (MOBD)

www.mass.gov/mobd

The Massachusetts Office of Business Development (MOBD) is committed to helping companies create and retain jobs, as well as promote private investment in our state. We facilitate simplified, timely access to a host of governmental and non-governmental resources and incentive programs that will help businesses grow faster and stronger in Massachusetts.

Massachusetts Small Business Development Center

www.msbsd.org

small business, strategic planning, business advisory services, free, confidential

The MSBDC Network provides free, confidential one-on-one business advisory services to entrepreneurs and the small business community focusing on business growth and strategies, financing and loan assistance, as well as strategic planning, marketing and operational analysis. In addition, low cost educational training programs are offered across the state targeted to the needs of small business.

Massachusetts Technology Transfer Center

www.mattcenter.org

The Massachusetts Technology Transfer Center is an organizer of the Annual Conference on Clean Energy and MA Clean Energy Week.

The Massachusetts Technology Transfer Center (MTTC) has a government mandate to help any inventor in any non-profit research institution to commercialize his or her technology. MTTC helps entrepreneurs to start companies and researchers to market their patents through a broad array of high quality programs and resources.

New England Business Associates Business Development Center

www.nebaworks.com/BCC

The NEBA Business Development Center (BDC) works with individuals to **develop business plans**. Located in the Scibelli Enterprise Center, STCC's Technology Park, the Business Center assists in developing a **SCORE** based business plan, including **financials and marketing** plan. Serving all of Western MA and northern Connecticut, the BCC has assisted over 30 businesses in getting started with ongoing support upon request.

New England Women in Energy & the Environment

www.newiee.org

NEWIEE aims to harness the passion, intelligence and leadership experience of women to promote and encourage public interest in the energy and environmental sectors.

Founded in Boston in 2008 by a group of eminently accomplished women in the sector, NEWIEE harnesses the passion, intelligence and leadership experience of New England women to promote and encourage public interest in the energy and the environment sectors. Comprised of members across the public and private sectors, as well as various age groups, NEWIEE is also a stimulating forum for networking, sharing of expertise and information and mentoring.

New England Clean Energy Council

www.cleanenergycouncil.org

The New England Clean Energy Council was formed in 2007 to help our region, with its considerable innovation assets, employ the power of free markets to become a leading provider of clean energy solutions to the global marketplace.

The Council represents over 175 member organizations, including clean energy companies, venture investors, major financial institutions, universities, industry associations, utilities, labor and large commercial end-users. The research and commercialization partnerships formed through the consortia leverage the nation's under-utilized, world-class research university sector, involve the venture and entrepreneurial private sector for market insight and commercialization mentoring, and include public-private partnerships to build and leverage clean energy clusters and drive economic impact.

Northeast Sustainable Energy Association

www.nesea.org

Sustainable, Building, Energy, Connections, Development

The Northeast Sustainable Energy Association is the nation's leading regional membership organization promoting sustainability in the built environment. For more than 35 years, NESEA has supported and inspired a community of practitioners in the sustainable energy and building field from Maine to Washington, DC. In the words of one of our members, "this is where the movers and shakers of sustainability are."

Our programs include the annual BuildingEnergy Conference, the region's premier sustainability conference, and Green Buildings Open House, a 10 state tour featuring new and retrofit low energy homes and businesses. Come see where NESEA can take you!

Pioneer Valley Local First

www.pvLocalFirst.org

Here in the Pioneer Valley of Western Massachusetts, we are blessed with great natural beauty and a vibrant local living economy made up of independent businesses, wonderful family farms, educational institutions and active community organizations. It's a rich and diverse culture and one that *Pioneer Valley Local First* is dedicated to protecting and strengthening.

Since 2001 our mission is to encourage people to *Think Local First* so that they *Buy and Bank Local First*. Additionally, we encourage and support companies to be socially, locally and environmentally responsible. We do this by educating and encouraging Pioneer Valley citizens, community organizations, businesses and local governments about the benefits of doing business with locally owned, independent businesses.

Regional Employment Board of Hampden County, Inc.

www.rebhc.org

workforce development, WIA, youth, sector initiatives, workers

The Regional Employment Board of Hampden County, Inc. (REB) is a business-led, non-profit corporation established by state and federal legislation and supported by local business, education, and labor leaders as the primary policy-making authority in developing workforce skills.

Our only business is workforce development. In partnership with government, business, labor and education and training providers, we coordinate, fund and oversee all the region's publicly funded worker training and employee placement programs.

Rebuild Springfield

www.developspringfield.com

At the request of Mayor Domenic J. Sarno, DevelopSpringfield and the Springfield Redevelopment Authority have formed a public-private partnership, which will plan and manage a comprehensive multi-year effort to rebuild all sections of the City affected by the June 1 tornadoes. Key stakeholders, including the business community and neighborhood groups, will be consulted throughout the planning and management process.

Scibelli Enterprise Center at STCC

www.stcc.edu/sec

business building, mentoring, facilities, business training, incubator

The Scibelli Enterprise Center has been supporting the development of young businesses since 1999. Located in the STCC Technology Park in Springfield, MA, the Enterprise Center is a business building, home to the Business Incubator with its dozens of accomplished mentors waiting to help new businesses, the MA Small Business Development Center's Western Regional Office, SCORE, NEBA Business Development Center, and the US SBA. It's also home to a community of innovative companies and academic centers affiliated with Springfield Technical Community College (STCC) and the University of Massachusetts Amherst, and boasts mini-clusters in cleantech, education, and IT. The Scibelli Enterprise Center is a national model for the growth of the small business community and is a regional resource to connect the businesses with the resources they need to thrive.

The Scibelli Enterprise Center is also a proud founding member of ACTION, the Association of Cleantech Incubators of New England.

USDA Rural Development

www.rurdev.usda.gov

In fiscal year 2010, USDA Rural Development's Southern New England jurisdiction provided over \$570 million in financial assistance to the rural communities of Massachusetts, Connecticut and Rhode Island.

USDA, through its Rural Development mission area, administers and manages more than 40 housing, business and community infrastructure and facility programs through a national network of 6,100 employees located in the nation's capital and 500 national, state and local offices. These programs are designed to improve the economic stability of rural communities, businesses, residents, farmers and ranchers and improve the quality of life in rural America.

U.S. Department of Commerce | U.S. Commercial Service

trade.gov/cs

The U.S. Commercial Service is the trade promotion arm of the U.S. Department of Commerce's International Trade Administration. U.S. Commercial Service trade professionals in over 100 U.S. cities and in more than 75 countries help U.S. companies get started in exporting or increase sales to new global markets.

US Green Building Council – MA Chapter

www.usgbcma.org

green, building, sustainable, community, Massachusetts

The mission of the Massachusetts Chapter of the US Green Building Council is to promote the design, construction, and operation of sustainable buildings and communities in Massachusetts through education, mutual support, and advocacy, enabling an environmentally and socially responsible, healthy and prosperous environment that improves the quality of life.

One of the goals of the Chapter is to be inclusive of the entire state, and to reach out to the world of design, construction, and development to engage as many as possible who share our passion for sustainability. The road to this point began three years ago when The USGBC MA Membership Forum was formed with the support of The Green Roundtable/NEXUS. Since that time, progress to Chapterhood has been steady due to the efforts of many dedicated members and the Board of Directors as well as support from USGBC and NEXUS.

The USGBC MA Chapter provides engaging and transformative education, networking, advocacy and leadership opportunities for the sustainable building community and beyond. Our events and programming is supported by the volunteer efforts of our community members. We encourage participation from the green building industry and beyond in helping us achieve our mission.

WGBY

www.wgby.org

WGBY-57, with its large and dedicated audience, is an excellent marketing partner for many organizations. **WGBY** is a multi-channel, multimedia platform with a four-state reach. **WGBY** has five broadcast and cable channels (**WGBY**, **WGBYHD**, **WGBY Create**, **WGBY World**, and **WGBY Kids**). **WGBY** reaches 99 percent of television households in western Massachusetts. We have a large viewing audience that routinely overwhelms the audience of cable-only channels. In 2010, for the 7th year in a row, according to a Roper Public Affairs & Media Survey, PBS is viewed as the most trusted institution in the United States.

Colleges and Universities:

Clark University: International Development, Environment, and Community

www.clarku.edu/departments/idce

sustainable development, energy technology innovation, environmental justice, climate change mitigation, and energy efficiency measures

Our community of scholars and practitioners is dedicated to fostering environmental sustainability, social justice, and economic well-being in both the developing and developed world. The major forces of social change—grass roots initiatives, social movements, government policy, market approaches, entrepreneurship, technological innovation, individual action, and education—form the core of our transdisciplinary studies.

Greenfield Community College (GCC)

www.gcc.edu

RE/EE Certificate & Degree, Weatherization Installer Training

GCC offers a Renewable Energy/Energy Efficiency Certificate program as well as a two-year Degree program. We are also one of four community colleges in the state to pilot a comprehensive 78 hour Weatherization Installer course sponsored by the MassGREEN Initiative. GCC has had a very active Green Campus Committee for several years. Our President signed on early to the President's Climate Commitment. We are building a LEED certified \$13 million Core building as well as a zero net energy greenhouse.

- Friendly and personal student services
- Pioneering Renewable Energy/Energy Efficiency Programs
- Serving Northern Pioneer Valley
- "The Best community college on earth" Bill Cosby
- We're all about learning

Holyoke Community College

www.hcc.edu

Since its founding in 1946, HCC has focused on inspiring futures through education and training, access, and engagement. The goal is simple—exceptional preparation for personal and professional success through education for all learners.

HCC's highly-qualified, committed faculty and staff engage learners through innovative, relevant instruction and comprehensive student support services, ensuring that our students are well prepared for their next step in life—whether to transfer to a four-year institution, to advance in a career, to build skills, or simply to enhance their quality of life.

HCC faculty and staff support you in discovering your academic abilities and career aptitudes for the future you choose. We think you'll find that HCC provides the best start for attaining your goals, for one of the best dollar values in education today.

Marlboro College MBA in Managing for Sustainability

gradschool.marlboro.edu/academics/mba

Systems thinking, innovative leadership, triple-bottom-line

The Marlboro MBA provides you with the knowledge, skills, and connections to manage for sustainability. To succeed in today's turbulent, constrained environment, organizational leaders must understand how to use management to balance profit with the immediate and long-term needs and interests of many stakeholders. The Marlboro MBA fosters systems thinking and a multiple-bottom-line approach, with robust community skills and sustainability integrated across our curriculum, from accounting and finance to business law, economic theory, marketing, and entrepreneurship. Change the climate of business!

UMass Amherst Center for Agriculture

www.ag.umass.edu

The Center for Agriculture at the University of Massachusetts Amherst integrates the research, applied education and outreach work in agriculture, food systems and natural resources at the University of Massachusetts Amherst. The Center is the contemporary standard bearer of the university's land-grant origins and provides a link to the vibrant agricultural business sector in the state. It brings together programs from Stockbridge School of Agriculture, UMass Extension, and the Massachusetts Agricultural Experiment Station. The Center is a portal through which individuals, industries, and agencies connect with scientists and educators.

UMass Amherst Sustainability Initiatives

www.umass.edu/livesustainably

As a land-grant university, The University of Massachusetts, Amherst has a long history of supporting agriculture within the Commonwealth. The Center for Agriculture brings together agricultural programs from Stockbridge School of Agriculture, UMass Extension, and the Massachusetts Agricultural Experiment Station all in the new College of Natural Sciences.

The purpose of the Center for Agriculture is to serve as a portal through which individuals, industries, and agencies can connect with scientists and educators. Simply put, the Center for Agriculture provides access to all of the expertise within the agricultural programs of the university

UMass Amherst University Without Walls

www.umass.edu/uww

For over nearly 40 years the University of Massachusetts Amherst University Without Walls (UWW) has offered adult learners the opportunity to earn their first bachelors degree from UMass UWW that builds on credit granted for prior coursework and experience.

UWW recognizes that the deepest learning is that drawn from an integration of direct experience with theoretical understanding and a broad knowledge base gained from college courses. Adults move around, shift careers, take on new commitments, and otherwise live rich and varied lives. The result is often an equally varied and incomplete higher education background. UWW offers adult learners the opportunity to combine new course work from UMass Amherst with college-level learning gained from a variety of sources.

To support those enrolled in this unique and valuable program, UMass Amherst UWW provides specialized services for the adult student: flexibility in scheduling, courses and programs that match their interests and acknowledge their experience, opportunities to accelerate the degree process, consistent and available advising support, and innovative, quality course delivery available online or blended.

UMass Amherst Wind Energy Center

www.umass.edu/windenergy

The Wind Energy Center at the University of Massachusetts is a graduate engineering research and education program, offering masters and doctoral engineering programs in wind energy. The Center focuses on wind energy in New England, including: offshore wind power issues, resource assessment, renewable energy software development, hybrid power systems, wind turbine dynamics and control, and wind farm siting and performance. Program graduates have formed the core of the U.S. wind energy industry. The Center has an extensive history in the research, documentation and implementation of hybrid power systems, including development of the a fully functioning wind-diesel simulator, development of computer software models, and numerous papers and publications. The Center is now offering online professional short courses as well as graduate wind energy courses this Spring. Visit the Wind Energy Center website and the online course web site at: www.umassulearn.net/programs/online/wind-energy.

**Western New England University –
College of Engineering, Department of Mechanical Engineering and
American Society of Mechanical Engineers – Western MA Section**

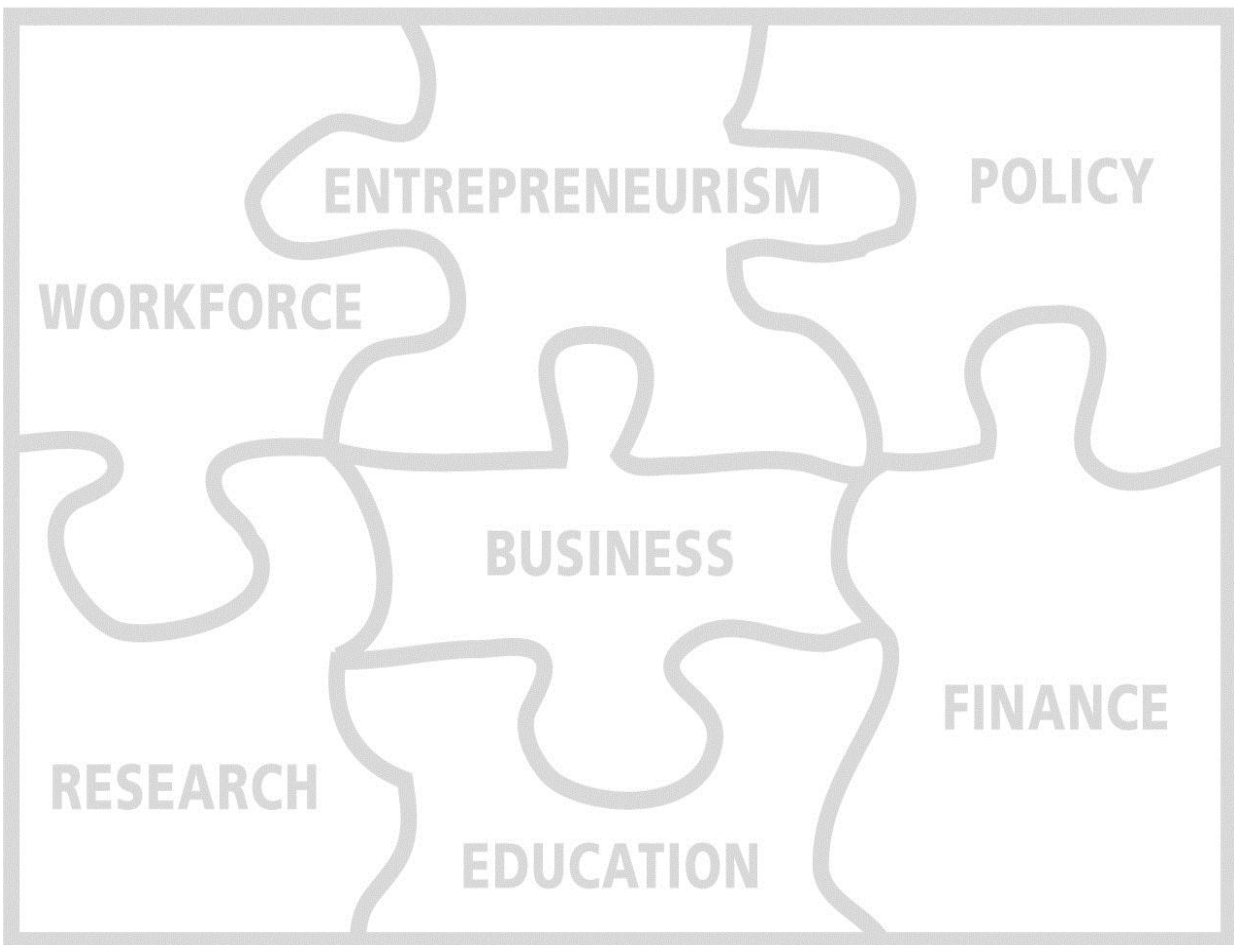
www.wne.edu

www.asme.org

Western New England University is a 4-year private university located approximately 4 miles east of downtown Springfield, MA, offering over 40 undergraduate programs in the College of Arts and Sciences, Business, and Engineering. Graduate and doctoral programs are offered in the Colleges of Arts and Sciences, Business and Engineering. The School of Law offers full- and part-time J.D. programs as well as a part-time LL.M. program. The College of Pharmacy welcomed its founding class in August 2011. The College of Engineering offers 4 undergraduate programs in Biomedical, Electrical, Industrial, and Mechanical Engineering. In addition, graduate programs are offered in Electrical (M.S.), Engineering Management (M.S. and Ph.D.) and Mechanical (M.S.) Engineering. The undergraduate programs in Electrical and Mechanical Engineering offer concentrations in “green” engineering, which utilize extensive clean energy facilities that include: PV, flat plate and evacuated tube solar collectors, a 1-kW horizontal axis wind turbine, a geothermal well and heat pump system, an alternative energy self-learning platform that includes a PEM fuel cell, a wood pellet boiler, and a bio-diesel manufacturing facility.

The American Society of Mechanical Engineers is a not-for-profit membership organization with approximately 120,000 members in over 150 countries worldwide. It promotes the engineering profession through collaboration, knowledge sharing, career enrichment, and skill development in order to help the global community develop solutions to benefit humanity.

PVPC STRATEGY TO DEVELOP A GREEN REGIONAL ECONOMY





PLAN FOR PROGRESS

Pioneer Valley Plan for Progress Strategy to Develop a Green Regional Economy

Phase I: Communication and Outreach

INTRODUCTION

The Pioneer Valley Planning Commission is the designated planning agency for the region and leads the development and implementation of the region's comprehensive economic development plan, the Plan for Progress. The Plan has 14 key strategies to promote and support economic success in the Valley, including the Strategy to Develop a Green Regional Economy, developed in 2009 in order to expand the region's existing clean energy and energy efficiency cluster and address the issue of increased "greenhouse" gases. Implementation of the strategy will be accomplished by committed individuals from a wide range of organizations, businesses and community groups, all of whom are encouraged to read the strategy, take part in planning sessions and public events, and talk to friends, neighbors and associates about what is happening all around us that is making us a "Green Region."

THE STRATEGY

This strategy intends to establish a regional economy where sustainable living and business practices combined with clean technology opportunities are core to our economic, environmental and cultural vitality. The strategy will be accomplished via goals and action steps in six key areas: business development; agriculture; education and workforce development; management and redevelopment of natural and built resources; transportation; and communication.

THE PIONEER VALLEY'S ROLE

Massachusetts is at the forefront of new developments in renewable energy and clean technology, and the Pioneer Valley, in particular, is home to one of several concentrations of clean energy and energy efficiency companies in the Commonwealth. This provides our region with a significant business growth opportunity, in light of the increasing costs of electricity and fossil fuels, the recent policy shifts toward clean energy and greenhouse gas reduction, and the continuing loss of traditional manufacturing in the state. Because Massachusetts, like most of

the U.S., is dependent on fossil fuels for energy, and because the state has no oil, coal or natural gas supplies of its own, businesses and residents must pay premium prices for fuel and electricity. Furthermore, the combustion of fossil fuels for electric power generation, transportation, heating and other uses is releasing “greenhouse” gases at a rapidly increasing rate. These factors support a significant investment in the growth of the clean energy sector, which includes renewable energy research and development, renewable energy facilities, energy efficiency, and demand response.

Massachusetts has created a number of policy programs that have stimulated tremendous activities and opportunities for renewable energy and energy efficiency in the region. First, the state passed a Renewable Energy Portfolio Standard (RPS) in 1997 which requires a small, but increasing, amount of electricity sold to Massachusetts customers to come from new qualified renewable energy sources. The Renewable Energy Trust Fund was then established in 1998 as a public benefit fund for renewable, energy-efficiency programs and low-income assistance programs. This program includes Commonwealth Solar and other renewable energy initiatives, including a Commonwealth Wind program currently under development. In 2007 Governor Patrick brought Massachusetts into the Regional Greenhouse Gas Initiative, a 10-state cap-and-trade program to reduce carbon dioxide emissions from large electric power plants. More recently, the Commonwealth passed several new laws in 2008 addressing clean and renewable energy, energy efficiency, and climate change: the Green Jobs Act, Green Communities Act, Clean Energy Biofuels Act, Global Warming Solutions Act, and Oceans Act. This legislation, together with new home energy efficiency tax credits, renewable energy source credits, and current and proposed federal legislation, will further support the development of this business sector and the move toward reduction of greenhouse gases.

The Massachusetts Technology Collaborative’s (MTC) 2007 Clean Energy Census reported that over 14,400 people were employed in this new and emerging sector, including technology developers, entrepreneurs, investors, inventors, venture capitalists and service specialists, among many others. The clean energy cluster is now poised to be the 10th largest economic cluster in the state. MTC further documented a 15% annual growth rate in new company formations since 1995, constituting a “boom” in this sector and leading companies to forecast that they will need to hire more skilled workers at an average annual rate of 20%. This is clearly a rate at which the Pioneer Valley could incubate and grow an industry sector of its own over the next decade.

DEVELOPMENT OF THE STRATEGY

To expand the clean energy and energy efficiency cluster and address the issue of increased greenhouse gases, the Pioneer Valley needs to develop and adopt more efficient and sustainable technologies. The conservation and development of sustainable energy sources is a component of the Pioneer Valley’s existing economy and one that can be “grown” to its economic benefit. Thus, the Plan for Progress is being updated with a comprehensive, unifying, regional strategy to develop a Green Regional Economy. This strategy will guide our region’s communities and policymakers as well as position the Pioneer Valley to become one of the

Commonwealth's leaders in making the green movement an integral part of its regional economic plan.

The Commonwealth's Lead "Green Region"

The key objective of this strategy is to enable the Pioneer Valley to pursue, create and support a regional community that is sustainable, competitive, vibrant and fully engaged in cooperating with the realities of an ever-changing 21st century global marketplace. We envision the Pioneer Valley becoming one of the Commonwealth's first pioneering "Green Regions," once again demonstrating it possesses the collective will, brain power, tools and commitment that is required to shape and realize a post-industrial sustainable economy and jobs base. This issue has been addressed previously in the Plan for Progress, as the 1994 Plan was updated to include a Sustainability strategy, and the 2004 Plan includes Sustainability as a "cross-cutting theme." This 2009 update to the Plan for Progress establishes the Green Regional Economy as a new, stand-alone strategy.

The Pioneer Valley Clean Energy Plan

Given the complexities of climate change, coupled with more recent problems of limited supplies and rapidly fluctuating prices for energy, these challenges will remain a focal point for public policy debates and increasingly will become a matter of economic survival. The regions which move most quickly and proactively to take on the new challenges will leverage the environmental and economic benefits accruing from becoming a "Green Region." The Pioneer Valley has already taken a crucial first step by developing and releasing the Commonwealth's first regional clean energy plan which outlines a regional sustainability strategy that can boost our region's environmental quality, as well as support a sustainable economy that can provide jobs, wealth and a decent standard of living for all Pioneer Valley residents. The plan calls for a strong and continuous commitment to energy efficiency and conservation as well as replacing fossil fuel use with renewable energy sources such as wind, solar, geothermal, low impact hydropower, biomass and biofuels. New clean energy-based local businesses would work together with improvements in transportation, home construction, energy efficiency and conservation, and energy production to build the region's economy and sustain communities in the Pioneer Valley. This plan has informed the goals of the Green Regional Economy Strategy and will help to guide implementation of the short- and long-term action steps.

OVERALL STRATEGY GOALS

The Green Regional Economy Strategy seeks to accomplish a number of changes in the Pioneer Valley's culture and way of doing business. These changes can be summarized under six areas: business development; agriculture and forestry; education and workforce development; redeveloping natural and built resources; transportation; and communication. In the next ten years, it is intended that Pioneer Valley residents witness the following effects of this strategy (*Note: these goals are written as affirmations*):

- 1) Our **business development** efforts have borne fruit as dozens of small- and medium-sized local businesses have been established in response to local, regional and international demand for clean energy, sustainable products, energy efficiency, and clean technology.

- 2) **Agricultural and forestry enterprises** in the Pioneer Valley are thriving, as existing agricultural land and forest is being retained for economically viable operations, and a valley-wide sustainable food system model has evolved. Local farmers are more successful; small-scale food enterprises flourish; and high quality locally-produced food is available to more residents.
- 3) Our Pre-K through post-secondary **education and workforce development** system has incorporated sustainability and clean energy curricula and fosters stronger collaborations between educational institutions, businesses and the community. Students at all levels learn environmental awareness and are exposed to sustainable career paths.
- 4) We are appropriately **managing and redeveloping the Pioneer Valley's natural and built resources** by harnessing our local renewable energy sources and implementing smart growth policies (including land conservation, re-use of existing buildings, and brownfield remediation).
- 5) We have an integrated, multi-modal regional **transportation** system that links our rural, suburban and urban communities and provides greatly expanded and affordable transportation choices for residents and workers.
- 6) A **communication** plan has engendered an ethic of sustainability in the Pioneer Valley economy and community and has established an international reputation for the Pioneer Valley as a model "green" region.

PHASE I: COMMUNICATION AND OUTREACH

The Strategy to Develop a Green Regional Economy will begin by addressing the Communication goal, detailed as follows with specific goals and action steps. *Please note: the Vision and Goals are written as affirmations.*

Communication and Outreach Vision and Goals

A **communication** plan has engendered an ethic of sustainability in the Pioneer Valley economy and community and has established an international reputation for the Pioneer Valley as a model "green" region.

- Local residents are aware of the benefits of clean energy and energy efficiency, and they have created a strong demand for efficiency-related products, alternative energy sources, and sustainable practices in the region.
- Environmentally sustainable practices and energy sources are now economically viable for local businesses, so that they are able to evaluate their economic strategies through the lenses of energy efficiency and clean technology.
- The Pioneer Valley has a strong identity as the location for the state's agricultural/forestry economy and the place to grow natural resource-based businesses.

- The Pioneer Valley has established a national reputation for its environmental consciousness and ideal cluster of natural, financial, and social capital and is attracting progressive entrepreneurs to the region, as well as retaining local college and university graduates.
- Eco-tourism is thriving, and visitors from all parts of the country and the world come here to see model buildings, facilities, transportation infrastructure, and community projects.
- Our thriving local businesses are the inspiration for many dozens of new startups due to their best practices being featured in regional media and grass-roots marketing efforts.
- Communities in the Pioneer Valley have adopted their own unique sustainability plans.
- We have established clear “green region” benchmarks, measuring our progress.

Communication and Outreach Action Steps

- Establish and implement a communications plan/campaign that educates residents, businesses, workers and visitors in the Pioneer Valley about the opportunities that exist through the growth of green business and practices. Identify target audiences, messages, and specific modes of reaching each audience. For example:

Communicate key sustainability messages:

- Opportunities of and methods for reducing energy consumption and waste
- Advantages of supporting local businesses including local agriculture and alternative energy facilities
- Existence of established and emerging green innovations in the Valley (to build regional pride and attract new green business to the region)
- Importance of alternative means of transportation and other approaches to sustainable living; promote importance of reducing vehicle idling
- Locations and descriptions of green job training programs and other resources for green business development
- Utility incentive programs
- State and federal tax credits

Establish key modes of communication delivery:

- Establish a regional green portal for sharing valued information across the Valley that will convene and maximize our social capital and available technology. For example: disseminating information about utility programs and interconnection issues
- Public forums for developing/exchanging ideas on new technologies and best practices
- Interconnect the many sustainable living and working networks throughout the Valley
- Establish a media Green Team involving regional media, web, and grass-roots communication leaders; feature columns in the *Republican* and *Gazette*

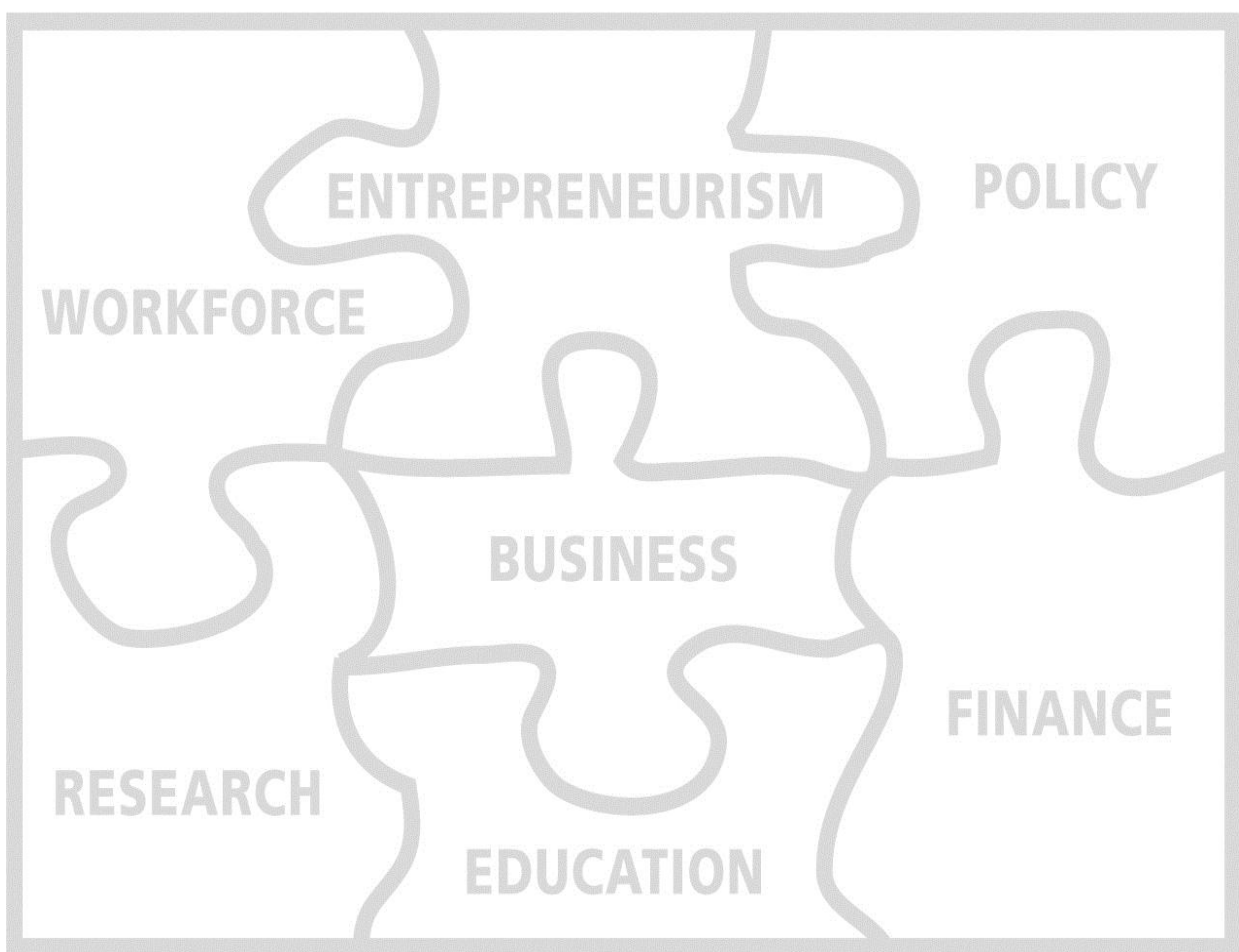
- Opportunities for businesses to advertise their services to consumers and other businesses seeking green services
- Provide general context for “green” guidelines and measurements, using established standards such as LEED and EnergyStar. Promote adoption of these standards by communities, companies, and the general public.
- Incorporate the Pioneer Valley’s green attributes and assets into our external marketing efforts. For example:
 - The Pioneer Valley is attractively positioned within the thriving “green” markets of Massachusetts and New England
 - Create marketing materials that showcase our assets to attract new green technology companies and visitors to the region
 - Highlight the advantages of our location in “the heart of New England”
 - Develop and promote eco-tourism destinations in this region
- Establish a “scorecard” by which to measure progress towards sustainability and a green regional identity.
- Mobilize existing organizations which advocate for sustainability, clean technology and energy efficiency to work together to accomplish these communication and consumer education goals.

IMPLEMENTERS

In order to be successful, a broad and inclusive cross section of our region’s public, private, and civic sector leaders must ultimately be recruited to take on this new task:

- Manufacturing firms
- Small businesses
- Real estate brokers and/or developers
- Financial institutions
- Investment and venture capital funds
- K-14 and higher educational institutions, both public and private
- Government institutions at all levels — federal, state, regional and local
- Non-profit organizations
- Volunteer citizen committees
- Public and private electric utilities
- Energy service companies
- Research institutions and labs
- Technology integrators
- Business and civic associations, including chambers of commerce
- Regional planning agencies

Poster Session



POSTER SESSION

Two of the region's universities have posters at this year's Clean Energy Connections conference. UMass Amherst is a powerhouse of clean energy research, attracting more than \$20M in clean energy research annually. Western New England University has active education and research programs and a novel Green Engineering concentration in its Department of Mechanical Engineering. Faculty and students will display posters of their current research giving participants a glimpse into where clean energy technology is headed.

- Building Energy Efficiency at UMass
- MassNanoTech at UMass
- PHaSE Energy Frontier Research Center at UMass
- TIMBR: The Institute for Massachusetts Biofuels Research at UMass
- UMass Wind Energy Center
- Western New England University – College of Engineering – Department of Mechanical Engineering



Building Energy Efficiency at UMass Amherst

Green Building is a world-wide movement to create cleaner and more energy efficient buildings. UMass Amherst, with its Building & Construction Technology program, has a number of faculty working on green building innovations.

Poster Titles and presenters:

“The energy benefits of trees: investigating shading, microclimate and wind shielding effects in Worcester, Massachusetts”

Presenters: Ben Weil and Emma Morzuch

“Building Construction Technology and the Building Energy Extension Program”

Presenter: Ben Weil

MassNanoTech at UMass Amherst

MassNanoTech, the research institute for nanotechnology at the University of Massachusetts Amherst, coordinates research on nanoscale materials, devices and systems, collaborates with industry, advances nanotechnology commercialization, educates students, and fosters outreach activities. It is UMass Amherst’s campus-wide initiative for nanoscale science and engineering.

The campus has built a strong reputation for innovation in nanoscale research, with breadth across many departments. Over 50 faculty investigators from eight departments in three colleges are working in the field of nanotechnology, generating over \$36 million in research funding since 1997 from a variety of federal and industry sources. Ongoing efforts include multiple prestigious NSF awards, licensing of key technology, acquisition of specialized characterization equipment, and the education and training of many talented graduate students working on innovative technologies in individual faculty labs. MassNanoTech provides a single point of contacts for academic and industrial collaborators.

Poster Titles and presenters:

“Roll-to-Roll Manufacturing of Nanostructured Materials and Devices at the NSF Center”

Presenter: Paul Clark

“PHaSE” Energy Frontier Research Center at UMass Amherst

The UMass Amherst Energy Frontier Research Center (EFRC) is one of 46 created across the nation by the U.S. Department of Energy Office of Basic Sciences as part of a major effort to accelerate the scientific breakthroughs needed to build a new 21st century energy economy. Our \$16 million, five-year Center (“Project PHaSE”) is one of 16 that were fully funded at creation under the American Recovery and Reinvestment Act (ARRA).

The EFRC program is designed to establish a stronger scientific base that will allow the U.S. economy to prosper while reducing dependence on petroleum as the prime energy source. PHaSE provides an unusually strong, integrative experience to graduate students, postdoctoral fellows, and scientists in the chemistry, physics, polymer science, and materials science of organic-based solar cell research. PHaSE’s team-based approach mirrors private sector companies and provides not only top-notch research, but also top-notch future researchers prepared for a world where technological advance is fast and expected to get faster.

Poster Titles and presenters:

“Functional Polythiophene Nanowires”

Presenter: Brent Hammer

“Solution Assembly of Conjugated Polymers for Hybrid Nanocomposites”

Presenter: Felicia Bokel

“Quantum Dot Polymer Composites with Controlled Morphology”

Presenter: Vikas Nandwana

“ PHaSE Energy Frontier Research Center”

Presenters: Paul Lahti and Lawrence Friedman

TIMBR at UMass Amherst

The development of alternative, renewable fuel sources to reduce or replace our dependence on fossil fuels has emerged as a paramount challenge for maintaining the economic security of the United States. An essential component of the quest for energy independence is to develop renewable, environmentally friendly sources of energy via the conversion of biomass (agricultural and forestry residues) to biofuels (e.g. ethanol and biodiesel).

An interdisciplinary team of researchers at the University of Massachusetts Amherst constitutes The Institute for Massachusetts Biofuels Research (TIMBR) with the goal of developing cost-effective technologies for producing ethanol, alternative fuels, and value-added materials from biomass. The TIMBR team consists of experts in all areas of biofuels research and development. TIMBR is vertically integrated to span the areas of biomass feedstock development, biological and chemical conversion to fuels, process development, and analysis. Expertise includes plant biology, microbiology, chemical catalysis, engineering, economic and environmental analysis.

Poster Titles and presenters:

“Developing Highly Efficient Processes for Acid-Catalyzed Aqueous Phase Conversion of Lignocellulosic Biomass to Produce Liquid Fuels and Fuel Precursors”

Presenter: Ronen Weingarten. Ronen is a Chemical Engineering PhD candidate working with Prof. George Huber.

“Unstructured Modeling of a Synthetic Microbial Consortium for Consolidated Production of Ethanol”

Presenter: Timothy Hanley. Tim is a Chemical Engineering PhD candidate working with Prof. Mike Henson.

UMass Amherst Wind Energy Center

The Wind Energy Center at the University of Massachusetts is a graduate engineering research and education program, offering masters and doctoral engineering programs in wind energy. The Center focuses on wind energy in New England, including: offshore wind power issues, resource assessment, renewable energy software development, hybrid power systems, wind turbine dynamics and control, and wind farm siting and performance. Program graduates have formed the core of the U.S. wind energy industry. The Center has an extensive history in the research, documentation and implementation of hybrid power systems, including development of a fully functioning wind-diesel simulator, development of computer software models, and numerous papers and publications. The Center is now offering online professional short courses as well as graduate wind energy courses .

Poster Titles and presenters:

“UMass Amherst Wind Energy Center: A Leader in Wind Energy Research and Education since 1972”

Presenters: Preeti Verma, Micah Brewer, and Eric Morgan

Western New England University – College of Engineering – Department of Mechanical Engineering

Western New England University is a 4-year private university located approximately 4 miles east of downtown Springfield, MA, offering over 40 undergraduate programs in the College of Arts and Sciences, Business, and Engineering. Graduate and doctoral programs are offered in the Colleges of Arts and Sciences, Business and Engineering. The School of Law offers full- and part-time J.D. programs as well as a part-time LL.M. program. The College of Pharmacy welcomed its founding class in August 2011. The College of Engineering offers 4 undergraduate programs in Biomedical, Electrical, Industrial, and Mechanical Engineering. In addition, graduate programs are offered in Electrical (M.S.), Engineering Management (M.S. and Ph.D.) and Mechanical (M.S.) Engineering. The undergraduate programs in Electrical and Mechanical Engineering offer concentrations in “green” engineering, which utilize extensive clean energy facilities that include: PV, flat plate and evacuated tube solar collectors, a 1-kW horizontal axis wind turbine, a geothermal well and heat pump system, an alternative energy self-learning platform that includes a PEM fuel cell, a wood pellet boiler, and a bio-diesel manufacturing facility.

Poster Titles and presenters:

“Performance Evaluation of the Western New England University Horizontal Axis Wind Turbine”

Presenter: Daniel J. Goodwin, Advisors: Dr. Said Dini, Mr. Curt Freedman;

“Design of a Stationary Fuel Cell Power Plant Enclosure”

Presenter: Matthew Siok, Advisors: Dr. Said Dini, Dr. Richard B. Mindek, Jr.

“Alternative Energy Demonstration System”

Presenter: David R. Griffin, Advisors: Dr. Said Dini, Dr. Richard B. Mindek, Jr.

“Improvement of the Biodiesel System and Process”

Presenter: Christian Gudmand, Advisor: Dr. Erik Miller

“Performance Analysis of the Solar Heating Collectors and Photovoltaic Panels”

Presenter: Adam Desmarais, Advisors: Dr. Said Dini, Mr. Curt Freedman

ACKNOWLEDGEMENTS

UMass Amherst organizes this Clean Energy Connections conference and opportunity fair. As the flagship campus of the University of Massachusetts system and the Commonwealth's land-grant institution, this event reflects the campus's responsibility to carry on programs around the state for the benefit of the citizenry and to maintain dynamic connections to communities across the state. It has special responsibilities for Western Massachusetts, where it is located, and for Springfield, the largest city in the region.

This event could not occur without the generosity and vision of the many sponsors and organizations highlighted in this notebook, the attendees and a handful of people who give of their time. Motivating all of these individuals and organizations in some way is the commitment to a carbon-neutral future which provides a clean environment in which to live and work, employment, and profits to those who take the risks.

Thank you, in particular, to:

| | |
|-------------------------|-----------------|
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And, to all the speakers, moderators, and poster contributors that make the program so compelling.

Thank you for a wonderful day.

NOTES