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ANNUAL REPORT



Letter from Executive Director



Alan Perlstein
Executive Director
and CEO

We're excited to bring you this year's Annual Report and highlight our successes over the past year as support continues to grow for the Midwest Energy Research Consortium.

In 2015 we grew our membership to 86 and we're excited about the future holds. Through partnerships and research we continue to solidify our leadership role as the premier collaborator and go-to industry hub for the energy, power and control sectors.

As our organization evolves, our focus and activity continues to reflect the direction given by our members. Through their input and our strategic planning efforts we're excited to announce our renewed focus on

the following three business lines:

- funding and growing our research efforts
- creating roadmaps to guide efforts to grow our industry
- developing our future workforce through WERC Bench Labs

In 2015 we successfully funded six research projects (highlights later in this report) investing more than \$475,000 in new technologies. We're excited about our plans to expand our research efforts in 2016 through continued partnerships with the region's top research institutions.

We're also excited about the completion of our industry roadmap focused on Energy Storage Systems in the first half of 2015 and are excited about the collaboration underway with The Water Council to develop a clear roadmap for the energy water nexus. This effort will no doubt highlight the incredible opportunities for our region to collaborate and develop new businesses.

Our report will also highlight the success of WERC Bench Labs and touch on the programs and workshops we oversee on entrepreneurship for teams and startups across all funding stages.

These programs provide access to world-class mentors, funding and a variety of resources needed to grow a business and develop a product.

We are grateful for the continued support of our members and partners and look forward to an exciting 2016. Together, we are Putting Energy to Work.

Sincerely,
Alan Perlstein
Executive Director and CEO

Letter from Board Chair



Michael Corradini
Director, Wisconsin
Energy Institute

In 2015, the Mid-West Energy Research Consortium continued to make great strides in our goal of re-shaping Milwaukee into a regional hub for the Energy, Power and Controls industries, a goal that is only possible thanks to dedicated support from our members, partners, and sponsors.

Our organization's partnerships continue to open doors for our members. Specifically our recent alignment with Argonne National Laboratory, The Water Council and the Midwest Energy Efficiency Association has increased our industry roadmapping capabilities.

Argonne hosted the 2015 M-WERC Technology Symposium in November. Argonne has also offered various programs that allow M-WERC members to directly cooperate on research activities and utilize their expertise and facilities for product innovation.

Thanks to generous grants from U.S. Small Business Administration and Wisconsin Economic Development Agency, M-WERC successfully launched WERC Bench Labs, an immersive, mentor-driven lean-startup program for small and early-stage companies involved in the energy, power and control sectors.

The Energy Innovation Center, which is the physical headquarters of M-WERC, has continued to serve our needs as the location for the inaugural class of WERC Bench Labs as well as our member meetings, workshops and networking events while providing satellite offices for several of our business service providers and partners.

M-WERC's research activities in 2015 resulted in two patent applications in addition to the three patent disclosures from the 2014-2015 Technology Innovation cycle.

I am also excited to announce a new Vice-Chairman of the board, Marv Klowak Global Vice President, Research and Development at Briggs and Stratton. He brings nearly 20 years of leadership experience in industrial research and development and I am looking forward to his continued support and participation.

Without the committed efforts of our members, partners, and sponsors the Mid-West Energy Research Consortium would not be able to pursue our industry development goals and expand the possibilities of our region to provide leading innovation, and a capable workforce.

On behalf of the M-WERC team, thank you for everything you do.

Sincerely,
Michael Corradini, Director
Wisconsin Energy Institute M-WERC Board Chairman

The Energy Innovation Center Update



Jeff Anthony
Director of Energy
Innovation Center



Greg Meier
Managing Director of
Innovation

Throughout 2015, M-WERC continued to operate and expand its presence in what once served as the former headquarters for what was the Milwaukee based Eaton Corporation.

The location known to our members as the Energy Innovation Center has continued to serve our needs as the location for the inaugural class of WERC Bench Labs as well as our member meetings, workshops and networking events while providing satellite offices for several of our business service providers and partners.

Our objective is to ensure that our business and academic members input has been incorporated into the design, development, and implementation of the Energy Innovation Center.

In addition to the regular presence of the start-ups and graduates of WERC Bench Labs the Energy Innovation Center saw an expansion of business service providers and M-WERC members opening offices and spending time working remotely out of the facility. This includes representatives from

- Clifton Larson Alan
- Whyte Hirschboeck Dudek
- Silicon Pastures
- General Capital Group
- Manufacturing Diversity Institute

Research and Patents

M-WERC 2015 ANNUAL REPORT TECHNOLOGY INNOVATION HIGHLIGHTS



Road Mapping

Completed technology innovation section of Industrial/Commercial Energy Efficiency Road Map

Completed Technology Innovation Section of Energy Storage Road Map

Intellectual Property

Two Patent Applications in process for Optical Current Sensing Technology

Three Patent Disclosures filed as part of our 2014 research efforts – all three are currently under review by University Patent Foundations.

Projects

Completed work on six technology innovation projects representing the 4th Round of M-WERC Funding

Events

Convened two workshops supporting technology roadmapping

Supported panel sessions for three open member meetings

Convened annual Technology Symposium at Argonne National Labs, the first M-WERC event held at a National Lab

Capability Support

Completed phase one of the build out of the Energy Innovation Center

Commenced joint Study with EPRI and We Energies on proposed Century City microgrid

Completed Commissioning of jointly funded UW-Madison, M-WERC Microgrid Lab Capabilities

Market Research and Development

Formation of Industrial Energy Efficiency

Working Group to accelerate the growth of energy efficiency projects in the manufacturing sector. This 24-member committee met five times in 2015.

- 5 meetings
- 24 members in committee

Three Roadmap Driven Member Meetings

Attracting Over 350 Members

- Energy Storage Systems- March 25th at DRS
- Industrial Energy Efficiency- July 16 at M-WERC
- Energy Water Nexus- September 17 at Marquette

New Memberships from Roadmapping Projects

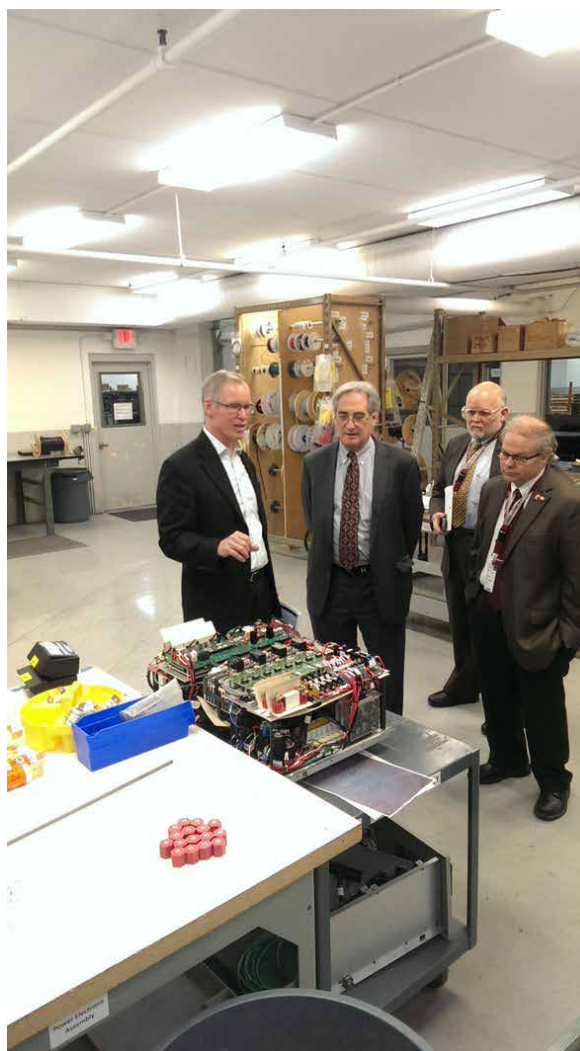
- General Compression- Boston, MA
- ViZn Energy- Austin, TX

The roadmapping effort resulted in a number of new relationships and partnerships for M-WERC and its members including connections with the Midwest Energy Efficiency Alliance Argonne National Labs, J-CESR, The Energy Storage Association, The Water Council- Milwaukee and the Wisconsin Chapter of the Union of Concerned Scientists.

Establishment of M-WERC Energy Storage System Project Database as well as an overall Industry Database

One Major Roadmap Report, Energy Storage Systems First Roadmap Public Report on Energy Storage Systems

Our four half-day, road mapping workshops engaged more than 150 members throughout the year. Topics included both Energy Storage Systems and the Energy Water Nexus.



M-WERC Roadmapping and Roadmaps had a major impact on the M-WERC organization and activities in 2015

Completed Commissioning of jointly funded UW-Madison, M-WERC Microgrid Lab Capabilities

Snapshot of Events

January 2015 Member Meeting

January 22, 2015

Potawatomi Hotel & Casino – this member meeting focused on biogas and related technologies, featuring presenters from the industry in Wisconsin as well as national speakers. The event featured a tour of the biogas digester located on-site at this facility.



March 2015 Member Meeting

March 25, 2015

DRS Technologies, Inc. – this event focused on Energy Storage technologies, the Energy Storage System strategic roadmap, and the Argonne Lab’s Joint Center for Energy Storage Research (J-CESR)

May 2015 Member Meeting

May 21, 2015

Milwaukee Area Technical College, Oak Creek – coordinated by the M-WERC Workforce Development Committee, this meeting highlighted the work of the committee and the various activities being pursued on workforce development.

July 2015 Member Meeting

July 16, 2015

M-WERC’s Energy Innovation Center – this meeting featured the accomplishments and projects being done by the M-WERC Industrial Energy Efficiency working group. Taking place in the middle of our inaugural Summer Program for WERC Bench Labs, this event featured practice pitches by the nine start-up’s in the early-stage start-up program (Mark Jewell’s “Selling Efficiency Effectively” presentation).

September 2015 Member Meeting

September 17, 2015

Marquette University – this event marked the beginning of the next M-WERC strategic roadmap on the topic of “Energy Water Nexus” and featured presentations by a number of member and partner organizations involved in this roadmap, including The Water Council – the partner organization with M-WERC on this particular roadmap.

November 2015 Tech Symposium

November 19, 2015

Argonne National Laboratory – our annual Technology Symposium, which affords an opportunity to hear about the latest technology innovation research projects featured a morning full of research updates and presentations by Argonne personnel on what they are working on and how they are partnering with M-WERC as well as three afternoon breakout sessions on current technology updates in key areas.



Open Innovation Workshops

In addition to the presentations at our regular monthly meetings M-WERC leaders hip convened a number of workshops supporting our technology road mapping as well as a series of group discussions on open innovation.

A number of events during the summer WERC Bench Labs program, including:

WERC Bench Labs Demo Day August 27, 2015

WERC Bench Labs held its first annual Demo Day at the Harley-Davidson Museum in Milwaukee. Graduates of the 12-week program had the opportunity to pitch the more than 500 investors, vendors and interested people in attendance at the event. [Click here to see a video with highlights of the event.](#)



WERCBench Labs

At its peak in the 20th Century, Milwaukee entrepreneurs created dozens of innovative and iconic companies like as Harley-Davidson, Johnson Controls and Briggs-Stratton.

Milwaukee's success as a startup city was built around engineers, garage tinkerers, builders, and makers. During these days of this business boom the region operated as an industrial commons. Engineering, R&D and manufacturing capabilities were closely located and mutually reinforced each other to drive sustained innovation.

Through WERCBench Labs M-WERC is re-inventing that period by taking steps to create the 21st Century Machine Shop of the World and the industrial commons to support it.

The program, a mentor-driven seed accelerator, incorporates Steve Blank's Lean Launchpad Program, for engineering, technology-oriented focused start-ups and early-stage companies.

The first 12-week class included nine start-up teams who worked on developing and commercializing technologies that included drones for water sampling, augmented and virtual reality, embedded systems, small-scale low-head hydro dam technology, and artificial intelligence enabled systems for more efficient use of energy in manufacturing.

It concluded with a demo day in August at the Harley Davidson Museum where more than 500 people gathered to see the results.

WERCBench Labs is supported by an impressive list of more than 80 mentors which includes entrepreneurs, executives from local corporations, and academics from our regional universities.

M-WERC Team



Alan Perlstein
Executive Director
and CEO



John Bobrowich
Director of Market and
Industry Expansion
& Executive Director
Emeritus



Elliot Berman
Deputy Executive
Director



Jeff Anthony
Director of Energy
Innovation Center



Thomas Fehring
Director of Special
Projects



Bruce Biehoff
Director of Technology
Innovation



Joshua Morby
Director of Public
Affairs



Greg Meier
Managing Director of
Innovation



Gustavo Lopez
Public Affairs
Associate



Michael Hanson
Administration
Coordinator

The M-WERC Board

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Chair, Wisconsin Energy
Institute, UW-Madison

**Mike Lovell, Chairman
Emeritus**
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University

William Weber, Secretary
Vice-President Design
Engineering, DRS Power
& Control Technologies,
Lead, M-WERC Technology
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Michael Krauski, Treasurer
Director of Corporate
Relations - College of
Engineering and Applied
Sciences, UW- Milwaukee /
Lead, M-WERC Workforce
Development

Alan Perlstein, Board Member
Executive Director and CEO,
Mid-West Energy Research
Consortium

**John Bobrowich, Executive
Director Emeritus**
Director, Market and Industry
Expansion, Mid-West Energy
Research Consortium /
M-WERC Executive Director
Emeritus

Tom Bray, Board Member
Dean of Applied Research,
MSOE

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Vice-President, Oak Creek
Campus, Milwaukee
Area Technical College /
Lead, M-WERC Workforce
Development

Kevin Fletcher, Board Member
Senior Vice President,
Customer Operations, We
Energies Lead, M-WERC
Market and Industry
Expansion

Hal Karas, Board Member
Attorney, Whyte Hirschboeck
& Dudek S.C.

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Manager, LEM USA

Michael Rowe, Board Member
EVP & COO, American
Transmission Company

Tom Otterlee, Board Member
Attorney, Michael Best &
Friedrich LLP

Lee Swindall, Board Member
Vice President Business and
Industry Division, Wisconsin
Economic Development
Corporation / Lead, M-WERC
Market and Industry
Expansion

Doug Weber, Board Member
Business Development
Manager, Alternative Energy,
Rockwell Automation
Lead, M-WERC Technology
Innovation

**Marvin Klowak, Vice-
Chairman**
Global Vice President,
Research & Development,
Briggs & Stratton Corporation

**Mary Ann Wright, Chairman
Emeritus**
Vice President Global
Technology and Innovation,
Johnson Controls, Inc.

Brett Peters, Board Member
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UW-Milwaukee

**Brian Thompson, Assistant
Treasurer**
President, UWM Research
Foundation

**Joseph Schimmels, Board
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of College of Engineering
and Professor of Mechanical
Engineering, Marquette
University

**Brian Thompson, Board
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UW-Milwaukee

Mark Mone, Board Member
Chancellor, UW-Milwaukee

**Mary Blanchard, Board
Member**
Associate Director, Wisconsin
Energy Institute, UW-Madison

**Mike Laszkiewicz, Board
Member**
VP & GM, Power Control,
Rockwell Automation

Membership + Partners

Members

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Alliance Federated Energy
American Transmission Company, LLC
Argonne National Labs
Boldt Construction Services
Briggs and Stratton Corporation
Carroll University
Clark Dietz Inc.
Clifton Larson Allen LLP
Connect.The.Dots, LLC
DRS Power and Control Technologies Inc.
ElectroMechanical Engineering Associates (EME)
Energy Law Wisconsin
EnSync Energy Systems
Franklin Energy Services, LLC
Freedom Field Renewable Energy Inc.
General Capital Group
General Compression Inc.
Godfrey & Kahn S.C.
Graef Engineering
Greenfire Management Services, LLC
Johnson Controls Inc. (JCI)
Jonco Industries
LEM USA Inc.
Manufacturing Diversity Institute
Marquette University
Milwaukee Area Technical College (MATC)
Michael Best & Friedrich, LLP
Miron Construction
Milwaukee School of Engineering (MSOE)

Odyne Systems, LLC
Regal-Beloit Corporation
Renew Now Facilities, LLC
Rockwell Automation Inc.
Setter-Roche, LLP
S & C Electric Corporation
Silicon Pastures
University of Wisconsin - Madison
University of Wisconsin - Milwaukee
University of Wisconsin - Parkside
ZAF Energy System Inc. / ViZn Energy Systems Inc.
We Energies Group
Whyte Hirschboeck Dudek
Wisconsin Manufacturing Extension Partnership (WMEP)
WIPFLI, LLP
Pierce Atwood
Fairbanks Morse Engine

Supporters

Colliers International
Wisconsin Economic Development Corporation
Wisconsin Housing and Economic Development Authority
Northwest Side Community Development Corporation
M7
Greenfire Management Services, LLC

Partners

American Council on Renewable Energy (ACORE)
Aerotropolis
Association of State Energy Research & Technology Transfer Institutions (ASERTTI)
American Society for Quality (ASQ)
Chicago Bridge & Iron Company (CB&I)
City of Milwaukee
Clean Energy Trust
Environmental and Energy Study Institute (EESI)
Leidos Engineering Company
Midwest Energy Efficiency Alliance (MEEA)
Milwaukee Institute
RENEW Wisconsin
Wisconsin State Energy Office
Sustainability Summit and Exposition
The New North
The Water Council
Tri-State Alliance
Wisconsin Center for Commercialization Resources (WCCR)
Wisconsin Bioenergy Initiative
Wisconsin Energy Institute
Wisconsin Technology Council
Wisconsin Wind Works
Home Repair Manager

Grant Updates

M-WERC Grants awarded in 2015

Wisconsin Economic Development Corporation (WEDC) EIC Phase II

Award Date: 10/1/14

Period of Performance:
6/1/14 – 6/30/18

\$800,500 Awarded, \$104,955.01 Disbursed

Wisconsin Manufacturing Extension Partnership (WMEP)

Award Date: 11/12/14

Period of Performance:
10/01/14 – 12/31/15

\$156,250 Awarded, \$156,250 Disbursed and used for programming and operation

WEDC EIC Phase III

Award Date: 6/5/15

Period of Performance:
6/1/15 – 12/31/17

\$350,000 Awarded, \$180,000 funded startups, \$50,000 funded Operations, \$120,000 remaining to fund future class of startups

JP Morgan Chase (JPMC)

Award Date: 7/7/15

Period of Performance:
7/7/15 – 7/6/16

Awarded: \$50,000

U.S. Small Business Administration (SBA)

Award Date: 8/10/15

Period of Performance:
7/1/15 – 6/30/16

\$50,000 awarded, \$50,000 Disbursed and used for WERC Bench Labs programming and operations