

MATERIALS ECO  
CONOMY  
ENERGY ENV  
IRONMNT MA  
ATERIALS ECO  
NOMY ENERGY  
ENVIRONMNT  
MATERIAL  
SECONOMY EN



# ABOUT

The Mid-Ohio Regional Planning Commission (MORPC) initiated the Materials+Economy+Energy+Environment (ME3) program in the Central Ohio region in 2011. ME3 is a U.S. Environmental Protection Agency (EPA) funded sustainability program to help manufacturing companies save money and reduce their environmental footprint through discounted technical services. Participants received an energy assessment, a lean and green facility review and a one year membership in the Ohio By-Product Synergy (BPS) Network to help convert waste materials into profitable feedstocks.

## ME3 is the integration of two successful initiatives

### • E3 (ECONOMY, ENERGY, ENVIRONMENT)

E3 is a coordinated federal and local initiative to help businesses grow and profit in a sustainable manner. E3 provides coordinated technical assessments, which include an energy assessment and a lean and green review. The E3 framework was successfully piloted in Columbus, Ohio in 2009.

### • OHIO BPS NETWORK

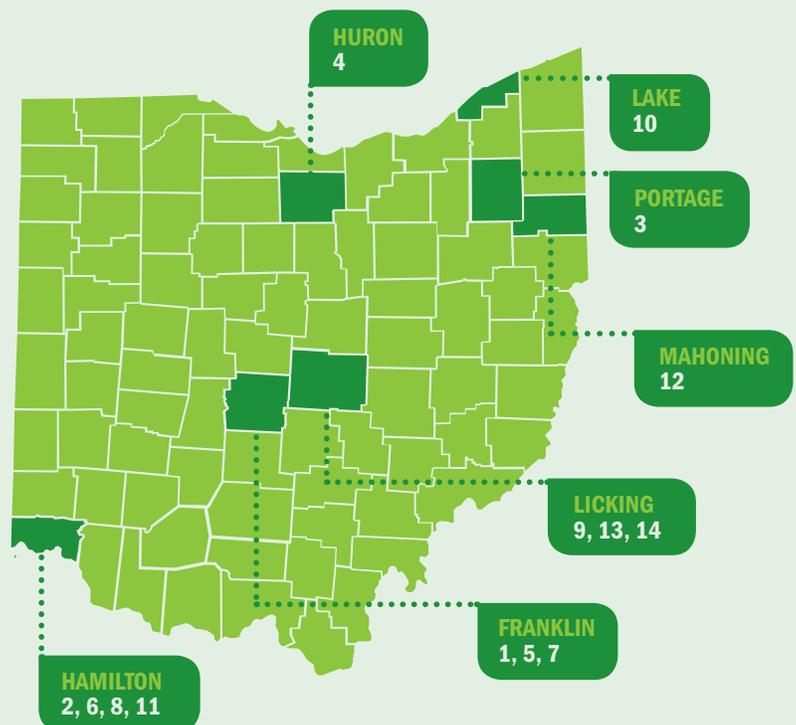
The BPS Network is facilitated by Sustainable Ohio, using a process created by the U.S. Business Council for Sustainable Development. The BPS Network offers businesses a safe forum to share innovative ideas and the opportunity to turn waste into profitable by-products by partnering with other businesses.

MORPC facilitated multiple technical services under the ME3 program, with the goal of producing cost-effective and measurable reductions in greenhouse gas emissions, energy usage, landfill disposal, water consumption and operational costs. Measurable results demonstrate the value of these programs and encourage broader adoption and replication.

**14** facilities participated in ME3 (2011-2015).

## Participating ME3 locations in Ohio

- 1 United McGill
- 2 Givaudan Flavors
- 3 MTD Products, Streetsboro
- 4 MTD Products, Willard
- 5 Armstrong World Industries
- 6 Samuel Adams Brewery
- 7 Calgon Carbon Corporation
- 8 L-3 Cincinnati Electronics
- 9 Momentive Performance Materials Inc.
- 10 Momentive Performance Materials Inc.
- 11 Patheon Pharmaceuticals, Inc.
- 12 Falcon Foundry Company
- 13 Polymer Technologies & Services, Inc.
- 14 State Industrial Products



# RESULTS

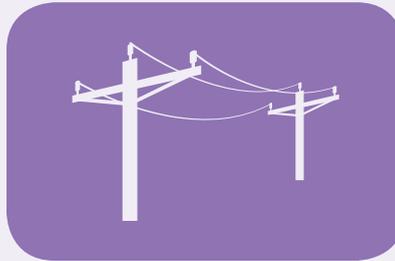
Through ME3, companies received reports documenting the financial and resource savings opportunities with the estimated return on investment. They also received follow-up consulting to help guide project implementation. Nine facilities have reported implemented projects through March 31, 2015, with additional projects in the planning phase.

## Estimated cumulative savings from implemented projects



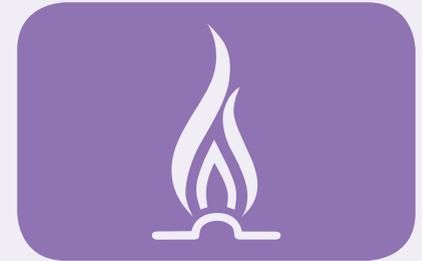
### CO<sub>2</sub> | 9 FACILITIES

Overall program: 3,300 MT CO<sub>2</sub>e\*  
Average per facility: 366 MT CO<sub>2</sub>e



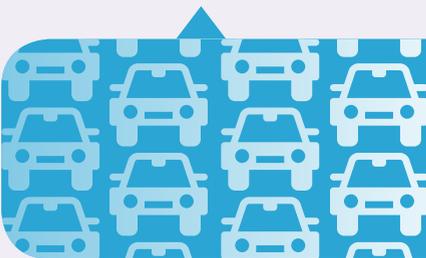
### ELECTRICITY | 8 FACILITIES

Overall program: 4.3 million kWh\*\*  
Average per facility: 540,000 kWh



### NATURAL GAS | 5 FACILITIES

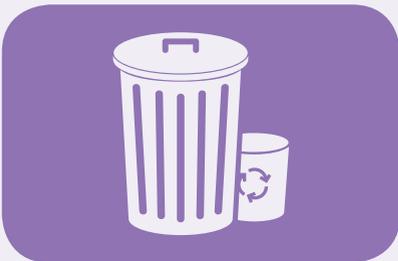
Overall program: 49,000 ccf\*\*\*  
Average per facility: 9,800 ccf



Equivalent to the  
annual greenhouse  
gas emissions of

**695** Passenger  
Vehicles

For more information, visit the U.S. EPA Greenhouse Gas Equivalencies Calculator at [epa.gov/cleanenergy/energy-resources/calculator.html](http://epa.gov/cleanenergy/energy-resources/calculator.html)



### WASTE | 2 FACILITIES

Overall program: 670 tons  
Average per facility: 335 tons



### WATER/SEWER | 2 FACILITIES

Overall program: 24.8 million gallons  
Average per facility: 12.4 million gallons



### FINANCIAL | 9 FACILITIES

Overall program: \$818,000  
Average per facility: \$91,000

Average per facility represents only the facilities with reported savings in the identified areas. The assessment services are customized to meet the needs of the businesses, so they may receive recommendations addressing some or all of the above metrics. Project implementation is voluntary and is influenced by business priorities, capacity and budgets.

\*MT CO<sub>2</sub>e | Metric tons of carbon dioxide equivalent

\*\*kWh | Kilowatt Hour

\*\*\*ccf | Centum Cubic Feet

# BEST PRACTICES & LESSONS

*MORPC and the project team identified best practices and lessons for those considering a similar program*

1

## **PUBLIC-PRIVATE PARTNERSHIPS ARE VALUABLE**

ME3 partners included the Ohio BPS Network, MAGNET, TechSolve, University of Dayton Industrial Assessment Center (UD-IAC), The Ohio State University, The City of Columbus, AEP Ohio and Duke Energy. The Ohio EPA also provided project support. MORPC facilitated program coordination and partners leveraged each other's expertise in delivering services. Utility companies provided incentives to encourage energy-saving projects. City and community leaders helped to promote the overall economic and environmental benefits.

2

## **BUILD IN TIME TO LAUNCH A NEW PROGRAM AND PLAN FOR DELAYS**

It took more than a year to establish the program structure, processes and outreach strategies. Expect to work closely with each company and the project team to establish a commitment from company leadership. Much time and effort went into establishing ME3 program commitments, which involved meetings, regular communications and close coordination with the company to finalize a participation agreement.

3

## **TARGET MARKETING AND WORK THROUGH EXISTING NETWORKS**

The team started by reaching out to manufacturing companies within the existing BPS Network. Participating companies were identified through coordinated outreach with the project team. The Ohio Manufacturers' Association was another valuable marketing partner. The ME3 team held workshops and webinars, distributed print materials, issued press releases, posted web updates and distributed e-newsletter articles to promote the program.

4

## **PEER-TO-PEER SHARING IS THE BEST MARKETING**

Testimonials and peer-to-peer sharing are crucial to convince other business leaders to participate. MORPC included presentations about ME3 at its annual Summit on Sustainability & the Environment, Central Ohio's signature environmental conference. MORPC worked with companies to share early success stories through Summit workshops and media releases, which convinced other companies to participate in the program.

5

## **CLARIFY EXPECTATIONS AND ENGAGE THE RIGHT PEOPLE**

Company leaders can make an informed decision based on clear project expectations. Involving company leaders early helps to achieve buy-in and desired results. Include plant managers, environmental health and safety staff, plant engineers and accountants in the decision-making process. The team provided a scope of work with estimated time commitment to companies interested in ME3. Even with a deep discount on ME3 services, some companies turned down the offer due to lack of capacity.

6

## **CHOOSE YOUR PATH**

ME3 requires the inclusion of E3 and BPS service offerings. While coordination of multiple services provides benefits, each aspect of the ME3 program has value on its own. Some companies turned down ME3 because they only wanted the energy assessment, while others focused solely on their waste streams. ME3 provides the umbrella for a holistic and integrated approach, but the service providers can offer any or all of the technical services from ME3.

# COMPANY HIGHLIGHTS & TESTIMONIALS

## UNITED MCGILL Columbus, Ohio

From TechSolve's lean assessment, we looked at recommendations to improve communications and reduce redundancy in our selling through shipping process. The UD-IAC energy assessment team offered 10 possible projects to reduce our energy consumption and carbon footprint. Six projects have been implemented, which include replacing lighting and fixing leaks in compressed air systems. The total investment was about \$100,000 with annual savings of about \$43,000."

*The assessments by both TechSolve and the University of Dayton Industrial Assessment Center (UD-IAC) were both thorough and professional and presented very easy to understand and usable results.*

## PATHEON PHARMACEUTICALS, INC. Cincinnati, Ohio

Patheon Pharmaceuticals, Inc. (Patheon) was invited by MORPC and TechSolve to participate in an ME3 Assessment focusing on material, energy, economy (productivity) and environmental performance.

This was also the first opportunity to coordinate placement of a Pollution Prevention (P2) Intern with a concurrent ME3 improvement initiative to participate and assist in the assessments and data collection. (Both of these programs were partially funded through U.S. EPA grants). Patheon is in the process of analyzing the assessment recommendations for implementation strategy."

*Through this program, Patheon was provided key assessments to identify measures to reduce purchased-material and waste-disposal costs, reduce energy usage and cost, increase economic productivity, conserve water and energy and reduce environmental emissions.*

## MOMENTIVE PERFORMANCE MATERIALS INC. Newark and Willoughby, Ohio

From these efforts, Momentive's Newark facility has realized nearly \$50,000 in rebates from American Electric Power and Columbia Gas. Energy conservation measures identified in the energy assessment inspired a project resulting in an 11 percent annual reduction in site natural gas usage. A water efficiency review facilitated execution of a project that will reduce site water consumption by up to 35 percent.

Momentive's Willoughby facility identified \$50,000 in savings from lighting efficiency projects and water consumption. A Waste Stream Value Stream Map exercise revealed additional potential savings of \$50,000 by focusing on the 4Rs (Refuse, Reduce, Reuse and Recycle) at the plant."

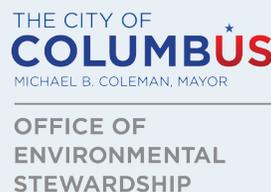
*In addition, future projects were suggested in the areas of compressed air, lighting, motors and HVAC that could increase savings by another \$100,000 per year.*

*Visit our website for a full case study at [morpc.org/me3](http://morpc.org/me3)*

# RESOURCES & PARTNERS

## Ohio ME3 Resources and Partners

- American Electric Power: [aepohio.com](http://aepohio.com)
- City of Columbus Office of Environmental Stewardship: [columbus.gov/getgreen/](http://columbus.gov/getgreen/)
- Duke Energy: [duke-energy.com/ohio.asp](http://duke-energy.com/ohio.asp)
- MAGNET: [manufacturingsuccess.org](http://manufacturingsuccess.org)
- MORPC: [morpc.org/me3](http://morpc.org/me3)
- Ohio By-Product Synergy Network: [sustainable-ohio.org](http://sustainable-ohio.org)
- TechSolve: [techsolve.org](http://techsolve.org)
- Sustainable Business Resource Guide: [morpc.org/me3](http://morpc.org/me3)
- The Ohio State University Sustainable and Resilient Economy program: [discovery.osu.edu/focus-areas/sustainable-economy/](http://discovery.osu.edu/focus-areas/sustainable-economy/)
- University of Dayton Industrial Assessment Center: [udayton.edu/engineering/centers/industrial\\_assessment/index.php](http://udayton.edu/engineering/centers/industrial_assessment/index.php)



## National Resources

- E3: [epa.gov/e3](http://epa.gov/e3)
- E3 How-to Guides: [e3.gov/action/how-to-guides.html](http://e3.gov/action/how-to-guides.html)
- U.S. Business Council on Sustainable Development (BPS projects across the country): [usbcسد.org/materials](http://usbcسد.org/materials)

*This publication was developed under Assistance Agreement No. AF-83495301 awarded by the U.S. Environmental Protection Agency through the Climate Showcase Communities Program. It has not been formally reviewed by EPA. The views expressed in this document are solely those of the Mid-Ohio Regional Planning Commission and EPA does not endorse any products or commercial services mentioned in this publication.*