Supporting Manufacturing Leadership Through Sustainability

E3: Economy, Energy, and Environment
What is E3?

A model for collaboration among manufacturers, utilities, local government, and federal resources intended to:

- Invest in local communities
- Address energy and sustainability challenges
- Provide valuable technical training and assessments
- Enable economic growth
Benefits for Manufacturers

Cost Savings
• Significant cost savings result from increased process efficiencies and reduced waste
• Profitable sustainability practices

Increased Competitiveness
• State-of-the-art sustainable business practices
• Technical support to drive entry into new markets
• Job creation and retention

Access to Technical and Financial Resources
• Additional funding through federal and state programs
• Enhanced skills and capabilities for workers
Benefits for Communities

Economic Growth
• Improved competitiveness of existing manufacturers
• Enhanced ability to attract new business
• Increased manufacturing jobs and/or job retention
• Trained workforce with skills for a sustainable economy

Progress toward Environmental and Climate Change Goals
• Catalyze meeting local government’s environmental and climate change goals
Benefits for Utilities

**Increased Competitiveness**
- Invest in local communities
- Strengthen and stabilize industrial rate-payers

**Progress toward Environmental and Climate Change Goals**
- Catalyze meeting environmental and climate change goals
- Achieve organizational carbon reduction goals
E3 – Federal Programs Working Together

DOC NIST
Manufacturing
Extension
Partnership

DOE Industrial
Technologies
Programs and IAC

MEP and EPA Green
Suppliers Network

EPA Pollution
Prevention and
Climate Leaders
Programs

DOL Employment
and Training

SBA and its Small
Business
Development
Centers
Technical Assessment

A Lean Review which leads to increased productivity and reduced costs

An Energy Assessment which provides tools and insight to reduce energy demand and costs

A Greenhouse Gas (GHG) Evaluation that teaches manufacturers how to calculate GHG emissions and evaluate reduction strategies

A Clean Review which results in water and energy conservation, reduced emissions, and additional cost savings

Post-Assessment Recommendations that guide each facility toward improvements in overall efficiency, reduced waste, more efficient use of resources including energy and water, and cost savings
Implementation Support

**SBA and its Small Business Development Centers (SBDCs)** provide business excellence counseling services and financing through guaranteed loan programs.

**DOL and its Workforce Investment Boards** provide green job and skills training and apprenticeships supported by workforce development and training grants.

**Local and Regional E3 Team** provides additional resources and support such as state recognition, internship programs and local funding and grant opportunities.
# E3 Metrics

## Economic Metrics:
- Jobs created
- Jobs retained
- Environmental savings identified
- Lean savings identified
- Other cost savings
- One time potential cost savings identified
- Individuals trained
- Number of small businesses engaged
- Percentage of small businesses engaged
- Number and value of SBA loans granted
- Capital infusion dollars invested
- Hours of counseling provided

## Energy Metrics:
- Energy conserved (MM BTU/kWh)
- Energy intensity per unit of production
- Carbon reductions (tons)
- Carbon intensity per unit of production

## Environment Metrics:
- Air emissions reduced (lbs)
- Solid waste reduced (lbs)
- Material intensity per unit of production
- Hazardous waste reduced (lbs)
- Hazardous materials reduced (lbs)
- Water pollution reduced (lbs)
- Water used/conserved (gal)
- Water intensity per unit of production
Where we are TODAY

Just getting started
E3 North Carolina Adds State and Local Partners

IES and NCDENR
GSN Lean and Green Reviews

WRP and NCSU
Energy Systems Assessments

NC OSH Worker Safety Audits

NC Economic Development Regional Partners
NC Small Business and Technology Development Centers
NC Workforce Development Boards and Community Colleges

Community Business Partners including Utilities and Manufacturers
Manufacturers will have access to the following E3 technical assessments and training.

- **Business Excellence Assessment**
- **Lean and Green Review**
- **Energy Systems Assessment**
- **Greenhouse Gas Evaluation**
- **Worker Safety Review**
### E3 Results: Columbus Ohio Pilot

#### PILOT COMPANIES

<table>
<thead>
<tr>
<th>Company</th>
<th>AGGREGATED RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.O.W. Industries, Inc.</td>
<td>Identified recurring savings - Annualized</td>
</tr>
<tr>
<td></td>
<td>Energy Savings - $1.7 MM</td>
</tr>
<tr>
<td></td>
<td>Environmental Savings - $2.6 MM</td>
</tr>
<tr>
<td></td>
<td>Lean Savings - $1.033 MM</td>
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<tr>
<td></td>
<td>Water pollutants avoided – <strong>257,000 pounds</strong></td>
</tr>
<tr>
<td></td>
<td>CO2 emissions avoided – <strong>19,000 tonnes</strong></td>
</tr>
<tr>
<td></td>
<td>SOx Reduction – <strong>215 tonnes</strong></td>
</tr>
<tr>
<td>G&amp;J Pepsi-Cola Bottlers, Inc.</td>
<td>Solid waste reduction – <strong>24,000 pounds</strong></td>
</tr>
<tr>
<td>Hirschvogel Incorporated</td>
<td><strong>Realized savings – Annualized</strong></td>
</tr>
<tr>
<td>Crane Plastics®</td>
<td>$660,000 implemented or committed since project began</td>
</tr>
<tr>
<td>ArceorMittal</td>
<td>$50,000 increase in sales identified</td>
</tr>
<tr>
<td>TimberTech</td>
<td>5 jobs identified as retained</td>
</tr>
</tbody>
</table>

*Source: [E3 Program](https://www.epa.gov/e3).*
## E3 Results: Implementation Status

<table>
<thead>
<tr>
<th>Manufacture Type</th>
<th>Average Demand Reduction (kW)</th>
<th>Annual Energy Reduction (kWh)</th>
<th>Annual CO2 Reduction (metric ton CO2)</th>
<th>Annual Cost Savings ($)</th>
<th>Company Investment ($)</th>
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<tbody>
<tr>
<td>HVAC</td>
<td>87</td>
<td>203,652</td>
<td>122</td>
<td>22,725</td>
<td>57,233</td>
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<tr>
<td>Commercial Bakery</td>
<td>30</td>
<td>241,154</td>
<td>145</td>
<td>34,947</td>
<td>51,562</td>
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<td>Confections</td>
<td>41</td>
<td>122,471</td>
<td>74</td>
<td>9,472</td>
<td>51,118</td>
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<tr>
<td>Aerospace MRO</td>
<td>96</td>
<td>518,502</td>
<td>311</td>
<td>45,571</td>
<td>93,324</td>
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<tr>
<td>Apparel</td>
<td>96</td>
<td>337,862</td>
<td>203</td>
<td>26,548</td>
<td>33,950</td>
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<tr>
<td>Apparel</td>
<td>27</td>
<td>94,240</td>
<td>57</td>
<td>8,208</td>
<td>40,932</td>
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<tr>
<td>Metal Fabrication</td>
<td>48</td>
<td>159,935</td>
<td>96</td>
<td>85,061</td>
<td>47,794</td>
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<tr>
<td>Aerospace OEM/MRO</td>
<td>42</td>
<td>414,296</td>
<td>249</td>
<td>81,018</td>
<td>179,410</td>
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<tr>
<td>Injection Molded Plastics</td>
<td>39</td>
<td>538,364</td>
<td>323</td>
<td>30,255</td>
<td>43,034</td>
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<tr>
<td>Aerospace OEM</td>
<td>51</td>
<td>272,978</td>
<td>164</td>
<td>20,723</td>
<td>36,993</td>
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<tr>
<td>Automotive Supplier</td>
<td>71</td>
<td>771,152</td>
<td>463</td>
<td>45,347</td>
<td>105,580</td>
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<td>Snack Foods</td>
<td>32</td>
<td>288,570</td>
<td>173</td>
<td>20,200</td>
<td>45,000</td>
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<tr>
<td>Plastic Extrusion</td>
<td>57</td>
<td>681,899</td>
<td>410</td>
<td>27,355</td>
<td>39,027</td>
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<tr>
<td>Grain Mill</td>
<td>195</td>
<td>1,334,536</td>
<td>802</td>
<td>82,612</td>
<td>275,690</td>
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<td>Metal Stamping</td>
<td>190</td>
<td>1,177,218</td>
<td>707</td>
<td>76,320</td>
<td>259,649</td>
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<td><strong>Total</strong></td>
<td><strong>1102</strong></td>
<td><strong>7,156,829</strong></td>
<td><strong>4,299</strong></td>
<td><strong>616,362</strong></td>
<td><strong>1,360,296</strong></td>
</tr>
</tbody>
</table>

### Completion Status
- **100% Completion**
- **Partial Completion – In Progress**
- **New – In Progress**
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