Welcome to the Neighborhood

• Lincoln Park Neighborhood
  • Hosted by Ecolibrium3
  • Sponsored by Minnesota Power
Project Focus

• Intern Assessment Areas
  • Water use
  • Air Compressors
  • Lean Manufacturing

• Ecolibrium3
  • Benchmarking

• Minnesota Power Assessment Areas
  • Lighting
  • Chillers
  • Boilers
Benchmarking

• Determine business interest

• ENERGY STAR Portfolio Manager
  • Energy and Water
  • Ecolibrium3
    • Help certify more businesses
Benchmarking Continued

• 7 enrolled in Portfolio Manager
• Trends
  • Energy
  • Waste

Industrial Apparel Manufacturer  Hotel  Brewery
Company A

• Brewery
  • General Cleaning
  • Grain Bags
• Minnesota Power Assisted
  • Chillers
  • Lighting
Company A: Recommendation 1

- **Cleaning Water use**
  - Different water use amounts for cleaning
  - Target of 80 gallons per tank
Recommendation 1 Continued

• Water meter hose attachments
  • Measure water used for cleaning
  • Maximum annual savings:
    • 139,900 gallons
    • $1,600
    • Payback 1 month
Company A: Recommendation 2

- Tank Cleaning
  - Reuse final tank water for pre rinse in next tank
    - 34,000 gallons of water annually
    - $400 saved annually
Company A: Recommendation 3

- Cleaning Nozzles
  - Switch to a lower flow option
    - 10 gpm to 1 gpm
    - 13,000 gallons of water annually
    - $150 annually
    - Payback 9 months
Company A: Recommendation 4

• Keg Washing
  • Reduce the number of times the kegs are washed
    • 6,000 gallons of water saved annually
    • $70 saved annually
Company A: Recommendation 5

- Grain Bags
  - Around 3,000 lbs a year
    - $360 / year
  - Mn Material Exchange or similar site
  - Local Interest
## Company A: Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Savings ($/year)</th>
<th>Cost ($)</th>
<th>Saved Annually</th>
<th>Payback</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of flow meter</td>
<td>1,600</td>
<td>120</td>
<td>139,900 gallons</td>
<td>1 month</td>
<td>Recommended</td>
</tr>
<tr>
<td>Reuse final rinse</td>
<td>400</td>
<td>0</td>
<td>34,000 gallons</td>
<td>Immediately</td>
<td>Recommended</td>
</tr>
<tr>
<td>Lower flow cleaning nozzle</td>
<td>150</td>
<td>120</td>
<td>13,000 gallons</td>
<td>9 months</td>
<td>Recommended</td>
</tr>
<tr>
<td>Keg Washing</td>
<td>70</td>
<td>0</td>
<td>6,000 gallons</td>
<td>Immediately</td>
<td>Further testing needed</td>
</tr>
<tr>
<td>Grain Bags</td>
<td>360</td>
<td>-</td>
<td>3,000 lbs</td>
<td>-</td>
<td>Recommended</td>
</tr>
<tr>
<td>MP 1: Remove one Chiller</td>
<td>1,400</td>
<td>3,000</td>
<td>17,000 kWh</td>
<td>1.1 years</td>
<td>Recommended</td>
</tr>
<tr>
<td>MP 2: Energy efficient lights</td>
<td>2,400</td>
<td>6,400</td>
<td>16,000 kWh</td>
<td>2.2 years</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
Company B

- Industrial Apparel Manufacturer: Motorcycle suits
  - Compressed Air
  - Taping Machines
  - Scrap Fabric
  - Value Stream Map (VSM)
- Minnesota Power Assisted
  - Mini split heat pumps
  - Lighting
- Ecolibrium3
  - Lighting Quality
Company B: Recommendation 1

- Compressed Air
  - Stop current leaks, and prevent future leaks
  - $470 annually
Company B: Recommendation 2

• Taping Machines
  • Reduce non use run time
  • Improved scheduling
  • $1,200
Company B: Recommendation 3

• **Scrap Fabric**
  • Just under 1 ton a year
  • Mn Material Exchange or similar site
  • Local Interest
Company B: Recommendation 3

• Introduction to Lean Manufacturing
  • Goal: Increase Process efficiency
    • Value Stream Mapping
      • Increase value added time, decrease non value added time
  • Best Practices
<table>
<thead>
<tr>
<th>Description</th>
<th>Savings ($/year)</th>
<th>Cost ($)</th>
<th>Saved Annually</th>
<th>Payback (Months)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fix current leaks in the air compressor</td>
<td>470</td>
<td>-</td>
<td>3,000 kWh</td>
<td>-</td>
<td>Recommended</td>
</tr>
<tr>
<td>Turn off equipment not in use, reduce run time by 50%</td>
<td>1,200</td>
<td>0</td>
<td>-</td>
<td>Immediately</td>
<td>Recommended</td>
</tr>
<tr>
<td>Find alternative use for scrap fabric</td>
<td>360</td>
<td>0</td>
<td>1,800 lbs</td>
<td>Immediately</td>
<td>Further activity needed</td>
</tr>
<tr>
<td>Value Stream Mapping</td>
<td>New Tools Gained</td>
<td></td>
<td>Improved Productivity</td>
<td>-</td>
<td>Recommended</td>
</tr>
<tr>
<td>MP 1: Shades over Minisplit AC</td>
<td>1,100</td>
<td>5,000</td>
<td>13,500 kWh</td>
<td>36</td>
<td>Recommended</td>
</tr>
<tr>
<td>MP 2: Energy efficient lights</td>
<td>3,000</td>
<td>21,000</td>
<td>41,000 kWh</td>
<td>74</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
Company C

• Industrial Soft Goods Manufacturer
  • Compressed Air
  • Scrap Materials
  • Value Stream Map (VSM)
Company C: Recommendation 1 & 2

• Compressed Air
  • Stop current leaks, and prevent future leaks
    • $28 per year
    • Payback 7 months

• Scrap Materials
  • Mn Materials Exchange
Company C: Recommendation 3

- Introduction to Lean Manufacturing
  - Goal: Increase Process efficiency
    - Value Stream Mapping
      - Increase value added time, decrease non value added time
    - Best Practices
VSM

Bundle of 6 of 396

Computer → Cut → Bins → Box Finishing → Sewing → Straps/snaps → Sewing → Riveting → Burning → Inspection

5 min VA → 30 min VA → 5 min VA → 5 min VA → 120 min VA → 120 min VA → 180 min VA

Shelf Instant-3 days NVA

Instant-day NVA

Instant NVA

120 min VA → 30 min VA → 18 min VA → 5 min NVA → 5 min NVA

Level of Time Variation

Store → Whole Sale → Overstock → Out the Door
## Company C: Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Annual Cost Saved ($/year)</th>
<th>Est. Project Cost ($)</th>
<th>Saved</th>
<th>Payback (Months)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fix current leaks in the air compressor system</td>
<td>28</td>
<td>15</td>
<td>300 kWh</td>
<td>7</td>
<td>Recommended</td>
</tr>
<tr>
<td>Find alternative use for scrap fabric</td>
<td>360</td>
<td>0</td>
<td>-</td>
<td>Immediately</td>
<td>Recommended</td>
</tr>
<tr>
<td>Value Stream Mapping</td>
<td>New Tools Gained</td>
<td></td>
<td>Increased Productivity</td>
<td>-</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
Knowledge Gained

• Improved Communication Skills
  • Networking
  • Public speaking (like right now)

• Improved Problem Solving
  • Real world calculations
  • Creativity -> ideas ideas ideas
    • The love of the chase
  • Time management
Thank you!

Ecolibrium3
Minnesota Power
MPC
Deeper Assessment Businesses
Benchmarking Businesses
MnTAP
Questions?

This project was sponsored in part by Minnesota Power