Groups Involved

Antea Group

- On the Brewers Associations Sustainability Subcommittee
- Created the Sustainability Manuals
- Currently running the Sustainability Benchmarking Study
Groups Involved

Brewers Association

- Provides technical information and tools to new and established brewers
- Networking for brewers
- Marketing channels to brewers
- Promotes changes to laws that help small brewers
Craft Brewing in Minnesota

• All breweries in Minnesota are considered craft breweries
• Currently 19 breweries in planning in Minnesota
• Over 80 currently open in 2015
• 500,000 bbl packaged just in 2014
Reasons for MnTAP Assistance

- Small local breweries with taprooms are a booming industry for Minnesota thanks to the Surly Bill
- Concerns about water use and other utilities
- Get our name into a local industry that is growing
- First time benchmarking has happened for small breweries
Benchmarking Project

- Brewers Association Project to go with the Sustainability Manuals
- Goal 250 breweries of all sizes, types, and locations
- Performance Indicators being studied

<table>
<thead>
<tr>
<th>Resource</th>
<th>Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>60 to 285</td>
<td>kWh/bbl</td>
</tr>
<tr>
<td>Water</td>
<td>8.7 to 14.1</td>
<td>Bbl water/bbl</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>2.4 to 10</td>
<td>Therms/bbl</td>
</tr>
<tr>
<td>CO2 usage</td>
<td>5.8 to 20.3</td>
<td>Lb CO2/bbl</td>
</tr>
</tbody>
</table>
Reason for the Study

- Shows where time would best be spent
- Can identify positive or negative changes in the process
- Less resources are used
- Saves money
- Better image for the industry
Data from Minnesota Breweries

- Contacted 75 brewers of all sizes
- Over 60% produce less than 1,000 bbl/year
- 7 Completed data sets
- 10 in-progress
How is Minnesota Doing?

**Electrical Usage**

- Median
- Top 25%

**Natural Gas Usage**

- Median
- Top 25%
How is Minnesota Doing?
How is Minnesota Doing?

Cost Breakdown by Utility

- Median
- Top 25%
Where is this Data Going?

• Brewers Association Report
• Brewers Association Benchmarking Program
  • Real-time tracking
  • Goals
  • Resources to improve with
  • Case studies
Sustainability Assessments

• Four breweries from 200 to 2,000 bbl/year
• Overview of their efficiency
• Looked for low hanging fruit
• Talked about their future plans
The Power of Tracking This Data

- Quick and easy
- Gets everyone on the correct mindset
- Corrections can be made with no or little capital cost
- Identifies areas of improvement
Cost Avoidance

Cost Contribution For 2014

<table>
<thead>
<tr>
<th>$/bbl pkgd</th>
<th>Electricity</th>
<th>Wastewater</th>
<th>Natural Gas</th>
<th>Purchased CO2</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-</td>
<td>$9.59</td>
<td>$1.25</td>
<td>$5.75</td>
<td>$2.22</td>
<td>$1.94</td>
</tr>
</tbody>
</table>

Potential Cost Avoidance at Goal Efficiencies

<table>
<thead>
<tr>
<th>$/year</th>
<th>Electricity</th>
<th>Purchased CO2</th>
<th>Water</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>$3,442</td>
<td>$1,011</td>
<td>$2,170</td>
<td>$1,800</td>
</tr>
</tbody>
</table>

Legend:
- Electricity
- Wastewater
- Natural Gas
- Purchased CO2
- Water
Power Study

• Electric use was about 3 times the average for a brewery of similar size

• Biggest energy hogs
  • Evaporator fans were running 24/7
  • Fan in the brewery
  • 6.5% energy reduction possible

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Power Reduction</th>
<th>Capital Cost</th>
<th>New Saving</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan controller</td>
<td>3000 kWh/year</td>
<td>$600</td>
<td>$245</td>
<td>1.9 Years</td>
</tr>
<tr>
<td>Use comfort fan only when needed</td>
<td>1550kWh/year</td>
<td>$0</td>
<td>$140</td>
<td>Immediate</td>
</tr>
</tbody>
</table>
Personal Benefit

• Real world experience
• Communication skills
• Organizational skills
• Management skills
• Learned the value of time and money for a small business
Thank You

• Questions?