Target’s CO$_2$ Experience

Paul Anderson
Sr. Group Manager Engineering
<table>
<thead>
<tr>
<th>Store Location</th>
<th>Store Open</th>
<th>Low Temperature</th>
<th>Medium Temperature</th>
<th>High Side Refrigerant</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Paul, MN</td>
<td>July 2010</td>
<td>CO2 Secondary</td>
<td>Glycol</td>
<td>R-404A</td>
</tr>
<tr>
<td>San Clemente, CA</td>
<td>Oct 2011</td>
<td>CO2 DX</td>
<td>Glycol</td>
<td>R-134a</td>
</tr>
<tr>
<td>Conyers, GA</td>
<td>June 2012</td>
<td>CO2 DX</td>
<td>R-134a DX</td>
<td>R-134a</td>
</tr>
<tr>
<td>Los Angeles, CA</td>
<td>Oct 2012</td>
<td>CO2 DX</td>
<td>Glycol</td>
<td>Water Cooled R-134a</td>
</tr>
<tr>
<td>Columbia, MO</td>
<td>March 2013</td>
<td>CO2 DX</td>
<td>R-134a DX</td>
<td>R-134a</td>
</tr>
<tr>
<td>Energy Capital Investment</td>
<td>- Equipment</td>
<td>- Installation</td>
<td>Uptime (Guest Impact)</td>
<td>Maintenance and Repair</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------</td>
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<td>------------------------</td>
</tr>
</tbody>
</table>

From September 2012 FMI Presentation
Target’s CO₂ Experience

% Difference Energy Consumption

-20%  -10%  0%  10%  20%  30%  40%

North St. Paul, MN
San Clemente, CA
Conyers, GA
Los Angeles, CA
Columbia, MO
N/A
Hybrid R134a/CO$_2$ DX is the optimal solution for Target.
<table>
<thead>
<tr>
<th></th>
<th>Target’s CO₂ Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td>$2,000/year</td>
</tr>
<tr>
<td><strong>Capital Investment</strong></td>
<td></td>
</tr>
<tr>
<td>- Equipment</td>
<td>+25% - 30%</td>
</tr>
<tr>
<td>- Installation</td>
<td>+5%</td>
</tr>
<tr>
<td><strong>Uptime</strong></td>
<td>No Impact</td>
</tr>
<tr>
<td>(Guest Impact)</td>
<td></td>
</tr>
<tr>
<td><strong>M&amp;R</strong></td>
<td>$2,300/year</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td></td>
</tr>
<tr>
<td>(Carbon Impact)</td>
<td>-65%</td>
</tr>
</tbody>
</table>
Target’s CO₂ Experience

![Graph showing the total cost of ownership for different categories: Capital Investment - Equipment, Capital Investment - Installation, Maintenance and Repair, Energy. The graph indicates a significant cost savings for Capital Investment - Equipment and Maintenance and Repair compared to the baseline.]
Conclusion

• Improvement with each system
  • Understand your business drivers when investing in CO₂ systems
    • Recognized improvements in energy
  • Stay vigilant as an industry
    • More complex systems require higher complexity in:
      • Design
      • Manufacture
      • Operation
Thank you very much!