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P2 Engineer
NYSP2I
NYS Pollution Prevention Institute

- Established in 2008 “NYSP2I”
- HQ at RIT
- $4M in annual NYS funding
- Focus on reduction of natural resource consumption (water, raw material, energy) and elimination of waste and toxics
- P2 research, technical assistance, education and outreach
- 15+ full-time staff
Environmentally Preferable Purchasing (EPP)

EPP is the act of

✓ purchasing products or services
✓ whose environmental impacts have been considered and
✓ found to be less damaging to the environment and human health
✓ when compared to competing products or services.

https://practicegreenhealth.org/topics/epp

This comparison applies to raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance and disposal.

https://www.epa.gov/greenerproducts/about-environmentally-preferable-purchasing-program
Supply Chain Environmental Concerns

**Inputs**
- Transportation
- Packaging
- Energy
- Water

**Use & Distribution**
- Food manufacturing
- Consumer
- Future Generations

**Outputs**
- Waste water
- Air emissions
- All other wastes

**Impact**
Creating Sustainable Suppliers for EPP

Sustainable supply chain programs add tangible value to a company’s bottom line:

- **Revenue Growth**
- **Brand Reputation**
- **Cost Reduction**
- **Risk Mitigation**

Case Study Review:

Waste Generation and EPP Assessment
Background

• Hospital in downstate New York
• 240 medical staff

Interest Areas

• Environmentally Preferable Purchasing
• Total Cost of Ownership of products
• Environmental attributes of products
Project Objective

1. Examine purchasing records to identify focus areas
2. Explore the total cost of ownership (TCO) of products
3. Identify environmentally preferable alternatives
Process

- Analyzed purchasing records
- Researched alternative products
- Analyzed TCO & environmental attributes
- Chose viable alternatives
Analyzing Purchasing Records

- Worked with purchasing team to acquire records for a year
- 1,795 unique products
- Total annual purchase cost of $3.1 M
Analyzing Purchasing Records

- Top 10 products were chosen for focus

Distribution of Top 20 Purchased Medical Products (by number of units purchased):
- Textile: 40%
- Paper: 30%
- Plastic: 20%
- Rubber: 10%
- Kit: 5%
- Adhesive: 5%
- Metal: 5%

Distribution of Top 20 Purchased Medical Products (by annual cost):
- Textile: 25%
- Paper: 20%
- Plastic: 15%
- Rubber: 10%
- Kit: 10%
- Adhesive: 10%
- Metal: 5%
# Products Identified

<table>
<thead>
<tr>
<th>#</th>
<th>Product Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medc. Tissue Facial Bedside 40 CT</td>
<td>Small box of tissues</td>
</tr>
<tr>
<td>2</td>
<td>Sponge All Purpose Versal4ply 4 x 4</td>
<td>Medical wound sponge</td>
</tr>
<tr>
<td>3</td>
<td>Wipe SANI-Textile XLG 55% Alcohol</td>
<td>Sanitizer wipe</td>
</tr>
<tr>
<td>4</td>
<td>Cup Paper Hot Solo Symphony 10oz</td>
<td>Disposable Cup</td>
</tr>
<tr>
<td>5</td>
<td>486802 Glove Sensicare Medium Ice</td>
<td>Glove</td>
</tr>
<tr>
<td>6</td>
<td>Medc. Tourniquet Latex Free 1 x 18 RL</td>
<td>Tourniquet</td>
</tr>
<tr>
<td>7</td>
<td>Medc. Slipper SSO DBL tread XXL Yell.</td>
<td>Bedside Slipper</td>
</tr>
<tr>
<td>8</td>
<td>Carafe w/handle 1QT Mauve</td>
<td>Water Pitcher</td>
</tr>
<tr>
<td>9</td>
<td>Underpad 17 x 24 Tendersorb</td>
<td>Underpads</td>
</tr>
<tr>
<td>10</td>
<td>Proctor &amp; Gamble/Pampers</td>
<td>Baby diapers</td>
</tr>
</tbody>
</table>
# Total Cost of Ownership

## Medical Tissue (Facial Bedside) 40 CT

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Annual Purchase Cost</td>
<td>$4,315.00</td>
</tr>
<tr>
<td>Total Annual Disposal/tipping cost</td>
<td>$132.16</td>
</tr>
<tr>
<td>Total Annual Labor Cost</td>
<td>$5,739.72</td>
</tr>
<tr>
<td><strong>Total Estimated Annual Cost of Ownership</strong></td>
<td><strong>$10,186.88</strong></td>
</tr>
</tbody>
</table>
TCO Calculations for 10 products

- Purchase Cost: $83,709 /yr
- Disposal Amount: 20,984 lb
- Disposal Cost: $1,733
- Labor Cost: $28,615

Total Cost of Ownership: $113,427
Alternatives Assessment

• Alternatives were examined for each of the 10 products

Steps:
• Identified product concern
• Identified potential alternatives
• Identified procedure or purchase change
Example: Medical Tissue

Product concern:
• provided at bedside and disposed of, regardless of use

Potential alternative:
• Selecting items that are chlorine free or Green Seal Certified

Potential Procedure or Purchase Change:
• Housekeeping evaluation as opposed to automatic disposal
## Example: Bedside Facial Tissue

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Product Name</th>
<th>Environmentally Preferable Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wausau Paper</td>
<td>EcoSoft™ Facial Tissue</td>
<td>- Made of 100% recycled fiber and meets or exceeds EPA guidelines for post-consumer wastepaper content, and environmentally preferable packaging.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Select facial tissue is Green Seal™ certified.</td>
</tr>
<tr>
<td>Cascades</td>
<td>Facial Tissues</td>
<td>- Made from 100% recycled fibres using post-consumer and post-industrial materials.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Made with less water than the paper industry average.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Whitened without chlorine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Packaged in a material made from recycled fibres and 100% recyclable.</td>
</tr>
</tbody>
</table>
Results

• Top 10 products contributing to MSW stream were identified
• Environmentally preferable, cost effective alternatives were found for 8 of the 10 products identified.
Takeaways

• Important to focus efforts with upfront work
• Upstream decisions can have a real effect on purchasing, labor, and disposal costs (TCO)
• Understanding total cost of ownership is key to making smart purchasing decisions.
Rochester General Hospital (RGH)

General Info

- 500+ beds
- 1,200 + medical staff
- 5,000 + employees

Annual Waste Generation

- 2.8 M lb MSW
- 1.4 M lb RMW
- 282 K lb sharps
- 114 K lb cardboard
Project Objective

Interest Areas

• MSW and RMW composition
• Opportunities for decreasing waste and associated costs

Project Objective

• Characterize the waste streams
  • Purchasing record assessment
  • Solid waste audit
• Identify opportunities for improvement
Purchasing Record Assessment

- Analyzed purchasing records
- Focused on top suppliers
  - US Food
  - Owens & Minor
- Identified top 10 products from each supplier contributing to packaging waste
  - Only looked at products shipped in cases
# Packaging Waste Assessment

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item No</th>
<th>Item Description</th>
<th>Packaging</th>
<th>Unit Measure (UM)</th>
<th>Annual Unit Measures purchased</th>
<th># of cases per year</th>
<th># of cartons per year</th>
<th># of boxes per year</th>
<th># of packages per year</th>
<th># waste items</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3331</td>
<td>SPONGE GAUZE STERILE 2 X 2IN 8PLY 1806</td>
<td>Cases/30 Boxes/50 Package(s)/2 Each</td>
<td>Boxes</td>
<td>15,441</td>
<td>515</td>
<td>-</td>
<td>15,441</td>
<td>772,050</td>
<td>788,006</td>
<td>COVIDIEN</td>
</tr>
<tr>
<td>2</td>
<td>2332</td>
<td>SPONGE GAUZE STERILE 12 PLY TUB 4 X 4IN 6939</td>
<td>Cases/128 Package(s)/10 Each</td>
<td>Package(s)</td>
<td>45,569</td>
<td>356</td>
<td>-</td>
<td>-</td>
<td>45,569</td>
<td>45,925</td>
<td>COVIDIEN</td>
</tr>
</tbody>
</table>

- Based on type of packaging, estimated # of waste items was calculated
Solid Waste Audit

- Audited pediatrics ED and one nursing floor
- Collected waste over a 5 day period
- RMW visually inspected
- MSW physically inspected
### Audit Results

<table>
<thead>
<tr>
<th></th>
<th>Pediatrics ED</th>
<th></th>
<th>Nursing</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of bags per day</td>
<td># of bags per year</td>
<td>Weight per bag (lb/bag)</td>
<td>Waste per year (lb/year)</td>
<td># of bags per day</td>
<td># of bags per year</td>
<td>Weight per bag (lb/bag)</td>
<td>Waste per year (lb/year)</td>
</tr>
<tr>
<td>MSW</td>
<td>43</td>
<td>15,622</td>
<td>1.9</td>
<td>30,682</td>
<td>22</td>
<td>8,150</td>
<td>2.77</td>
<td>22,575</td>
</tr>
<tr>
<td>RMW</td>
<td>3.5</td>
<td>1,277</td>
<td>1.9</td>
<td>2,471</td>
<td>31</td>
<td>11,435</td>
<td>2.06</td>
<td>23,556</td>
</tr>
</tbody>
</table>
MSW Audit Results

MSW Stream (Physically Audited): Pediatric ED

- Misc. Food Waste: 30%
- Paper Towels: 20%
- Blue Wrap: 15%
- Plastic Wrap: 10%
- Plastic Cup: 5%
- Food Tray: 2%
- Plastic Bottles: 1%
- Aluminum Cans: 1%
- Utensils: 1%

Any opinions, results, findings, and/or interpretations of data contained herein are the responsibility of Rochester Institute of Technology and its NYS Pollution Prevention Institute and do not represent the opinions, interpretation or policy of the State.
RMW Audit Results

- Estimated savings = $200,000 annually
Takeaways

• Understanding your waste streams can uncover hidden opportunities to:
  • Reduce waste
  • Save $

By:
• Adjusting purchasing practices
• Training staff
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