Closing the Loop with Circular Blu

Presented by Christopher Bodkin

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Who We Are...
Circular Blu
Circular Blu is a consulting and manufacturing firm, dedicated to circular economy solutions to problematic waste streams.

Circular Blu works with the healthcare and business sectors to divert materials from landfill and redefine the value of waste by creating sustainable circular economy products.

Services
- Waste Stream Consulting and Programming
- Circular Economy Consulting

Products
- Upcycled Products
- Downcycled Rigid Products
- Downcycled Flexible Products

Partners
- Sustainable Solutions
- PLASTICS
- Work Without Limits
- Vizient
Our Focus

Hospital Plastics and Circular Products

New innovative processes created over industry best practices.

Professional consultancy services from industry experts.

Local and national solutions to address sterilization wrap recycling.
Intro to Circular Products

How Circular Blu is Changing Healthcare Purchasing
Closed Loop Process

1) Pick up material from healthcare facility
2) Divert material from landfill
3) Aggregate supply
4) Transport material to manufacturing/processing facilities
5) Convert material into recycled bags
6) Sell circular products back to healthcare facility.
Making Circular Products from Waste
Healthier Products

- Convert single use bags
- Working to convert other unhealthy products
- 100% recyclable drapes with On the Right Track
- Create circular PP repurposing programs
EPP and Environmental Attributes

EPP Attributes:
● 100% PCR Content
● 100% Recyclable Packaging
● 100% Recyclable Product
● Designed for Reuse
● Does not contain any harmful chemicals

Environmental Attributes
● 90% Reduction in Energy Consumption
● 77% Reduction in Contribution to Global Warming
● 62% Reduction in Smog Creation
● 51% Reduction in Water Use
● 44% Reduction in Eutrophication

Source: LIFE CYCLE IMPACTS FOR POSTCONSUMER RECYCLED RESINS: PET, HDPE, AND PP, American Plastics Recyclers. December 2018
The World’s Most Sustainable Tote

Made from upcycled sterilization wrap collected from participating hospitals
Products made from BlueCON Resin™

- Made from 80% blue wrap
- Wash Basin
- Fractured Bed pan
- Stackable Bed pan
- Pontoon Bed pan
- Disposable Surgical Scrubs

- 32 gallon Garbage Can
  22" Diameter x 28" H - 7 lbs.

- 45 gallon can w/wheels & Flip lid
  25 ¾ L x 21 ¼ W x 31 ¾ H - 9.75 lbs.

- 28 quart Recycling Bin
  14 ¾ D x 10 ¾ W x 15 ½ H - 2 lbs.

- 15 gallon Distribution Tote - w/hinged lid
  11D x 23 W x 15 H - 4.5 lbs.

- Nonwoven Fabric made from 100% recycled blue wrap
Case 1: Dartmouth-Hitchcock Closes the Loop

Dartmouth-Hitchcock Medical Center Wrap Collection Program

**Circular Blu works with DHMC to collect sterilization wrap. Material is sorted into pieces big enough to make tote bags and the rest is downcycled.**

Diverted close to 3 tons of wrap

- Dartmouth-Hitchcock has committed to buying back products made from their wrap waste through Medline.

Bags made from DHMC wrap

- The bags you are holding are made from DHMC’s wrap. Circular Blu has collected enough wrap to make over 5,000 bags.

Closing the loop
Case 2: Valley Hospital Replaces Single Use Bags

CEO Audrey Meyers Converts Valley Health System’s Disposable Patient Experience Bags to Reusable Circular Economy Bags

25k Reusable Patient Experience Bags
Made from Surplus Wrap diverted from landfill. Saved 21,540 kWh, over 16,000 of CO2, and 7,500 lbs of landfill space.

Bags Communicate Sustainability
A survey was given to evaluate the effectiveness of these bags communicating sustainability initiatives. These bags received an average of 4 out of 5 in their effectiveness.

More Hospitals Interested in Converting
There has been a sharp increase in demand for reusable alternatives to patient belonging bags.
The Valley Hospital Sustainability Questionnaire

1 Year later, employees at The Valley were polled on two questions:

Q1: On a scale 1-5, how effective are The Valley Hospital’s new Patient Experience Bags at communicating sustainability?
Result: 4/5

Q2: On a scale of 1-5, how well is The Valley Hospital communicating its sustainability efforts and initiatives?
Result: 4/5
EPP Policy Adoption

Year-Over-Year Comparison

Analysis

1. Healthcare leveraging spending power to increase sustainable product availability
2. Suppliers and GPOs need to respond with cost competitive EPP products
3. Sustainability and supply chain connections are being integrated
4. Healthcare leadership is driving change

Source: Practice Greenhealth
Extended Producer Responsibility (EPR)

EPR is a practice and policy approach in which producers are made responsible for collecting and processing their manufactured products upon the end of their lifetime.

- Many states in the US are passing EPR regulations.
- Nearly half of U.S. states now have some form of EPR policy.
- Creating sterilization wrap recycling programs will help.

Source: OECD (2013), What have we learned about extended producer responsibility in the past decade? – A survey of the recent EPR economic literature, Paris
Healthcare Circularity

Issues, Considerations and Solutions for Wrap Recycling in Healthcare
Waste Disposal costs are increasing
MSW Tipping fees projected to increase greatly. This will increase sterilization wrap disposal expenses for hospitals without recycling programs.

Landfills are reaching capacity
Landfills will reach capacity in less than 20 years. China banning import of recyclables will speed this up.

Tariffs are affecting domestic product creation
Imported goods are becoming more expensive, allowing more price competitiveness for domestic products.

Interest in closed loop products is increasing
Plastic waste is in national spotlight. Consumers are demanding sustainable products and products with PCR content.
**Landfill Capacities and Increased Fees**

Table 1: MSW tipping fees in 2017 with Forecast to 2021

<table>
<thead>
<tr>
<th>Region</th>
<th>2017</th>
<th>2018*</th>
<th>2019*</th>
<th>2020*</th>
<th>2021*</th>
<th>AAGR</th>
<th>5-Year total increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>$74.75</td>
<td>$75.92</td>
<td>$77.10</td>
<td>$78.25</td>
<td>$79.28</td>
<td>1.48%</td>
<td>6.06%</td>
</tr>
<tr>
<td>Southeast</td>
<td>$40.36</td>
<td>$40.87</td>
<td>$41.37</td>
<td>$41.85</td>
<td>$42.32</td>
<td>1.19%</td>
<td>4.86%</td>
</tr>
<tr>
<td>Midwest</td>
<td>$49.57</td>
<td>$50.63</td>
<td>$51.59</td>
<td>$52.55</td>
<td>$53.42</td>
<td>1.89%</td>
<td>7.77%</td>
</tr>
<tr>
<td>Western</td>
<td>$35.69</td>
<td>$36.58</td>
<td>$37.47</td>
<td>$38.27</td>
<td>$39.06</td>
<td>2.28%</td>
<td>9.45%</td>
</tr>
<tr>
<td>Pacific</td>
<td>$59.18</td>
<td>$60.84</td>
<td>$62.50</td>
<td>$64.07</td>
<td>$65.54</td>
<td>2.58%</td>
<td>10.73%</td>
</tr>
<tr>
<td>Entire US</td>
<td>$50.30</td>
<td>$51.19</td>
<td>$52.06</td>
<td>$52.84</td>
<td>$53.53</td>
<td>1.57%</td>
<td>6.43%</td>
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</table>

Table 2: Remaining Landfill Capacity in 2021 and Annual Rate of Capacity Loss

<table>
<thead>
<tr>
<th>Region</th>
<th>Remaining Capacity (years)</th>
<th>Annual rate of loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>8</td>
<td>-5.0%</td>
</tr>
<tr>
<td>Southeast</td>
<td>14</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Midwest</td>
<td>11</td>
<td>-4.0%</td>
</tr>
<tr>
<td>Western</td>
<td>22</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Pacific</td>
<td>17</td>
<td>-1.9%</td>
</tr>
<tr>
<td>USA</td>
<td>15</td>
<td>-2.6%</td>
</tr>
</tbody>
</table>

**These pricing forecasts do not incorporate China’s material ban, which will accelerate price increase and capacity loss dramatically.**

Source: Solid Waste Environmental Excellence Protocol (SWEEP)
Healthcare Recycling

Picking up the slack

- Issues with the recycling market are being seen throughout the sector.
- Waste haulers will not take sterilization wrap without a market to sell it.
- Little to no transparency with downstream supply chain.
- Sterilization wrap is undesirable due to lightweight and voluminous nature.
- Hospitals desire an end-of-life solution for sterilization wrap.
From Problem

To Solution
Our Comprehensive Solution

Providing recycling and repurposing solutions to create circular products made from sterilization wrap
Circular Program Flow

Wrap is sorted for appropriate stream

Hospital

BlueRenew Wrap recycling program

Upcycling Stream

Central Storage

Downcycling Stream

Tote Bags

Suit Bags

Resin

Gowns

Rigid Products

PCR Nonwoven
Thank You