Leaf and Yard Waste Diversion

Alberta CARE

September 8, 2011
Presented by Natasha Page
Outline

• The Leaf & Yard Waste Diversion Committee

• Work to date

• Results of Feasibility Study
Leaf & Yard Waste Diversion Committee

- Richard Binder  
  City of Calgary
- Donna Chaw  
  Alberta Environment
- Mary Curtis  
  City of Red Deer
- Don Davies  
  Stantec
- Lindsay Lofthouse  
  City of Calgary
- Daryl McCartney  
  University of Alberta
- Linda McDonald  
  Alberta CARE
- Jim Moore  
  BFI Canada
- Rob Olenick  
  Top Spray
- Natasha Page  
  Alberta Environment
- Joanne Walroth  
  Recycling Council of Alberta
- Neil Weins  
  Bio-Cycle Nutrient Solutions Inc.
- Allan Yee  
  City of Edmonton, CCC
Work to Date

- Leaf & Yard Waste Diversion Strategy – draft
- Feasibility Study – complete
- Full cost accounting – draft
- Life Cycle Assessments (LCA) literature review – complete

- Compost Marketing workshop, held in Airdrie, March 2011
Leaf and Yard Waste Diversion Strategy

• Proposed Outcomes
  – Diversion of leaf and yard waste from the waste stream to a beneficial resource stream.
  – Fundamentally, Albertans understand the benefits of managing leaf and yard waste as a resource. Albertans are engaged and participating.
Draft Strategy Recommendations

• Requires Government leadership (municipal and provincial)
  – Develop government procurement policies
  – Implement standardized waste measurement system
  – Establish performance measures, and report change in disposal rates

• Need to implement:
  – Communication, education, and training program
  – Sustainable grant fund for infrastructure development
  – Disposal ban on I&y waste
  – Accountability system to measure success

…but…committee still had outstanding questions and a consultant was hired to address them.
Feasibility Study – Part 1

• Leaf and Yard Waste Diversion Strategy Feasibility Study
  – Conducted by CH2M Hill to provide recommendations to L&YW Diversion Committee

• Topics addressed included:
  – What is the amount of material to be managed?
  – Infrastructure needs?
  – Processing options and costs?
  – Management of final product?
Leaf and Yard Waste Collected

Regions defined by Government of Alberta’s Land Use Framework

Includes estimated amounts from residential and ICI sectors, in t/yr
### Composting Capacity by Geographic Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Existing Organic Waste Processing Capacity</th>
<th>L&amp;YW Processing Deficit (tpy)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L&amp;YW only</td>
<td>Other Feedstocks</td>
</tr>
<tr>
<td>North Saskatchewan</td>
<td>12,270</td>
<td>314,100</td>
</tr>
<tr>
<td>South Saskatchewan</td>
<td>11,464</td>
<td>129,950</td>
</tr>
<tr>
<td>Red Deer</td>
<td>8,340</td>
<td>15,000</td>
</tr>
<tr>
<td>Lower Athabasca</td>
<td>4,250</td>
<td>43,000</td>
</tr>
<tr>
<td>Upper Athabasca</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>Lower Peace</td>
<td>55</td>
<td>0</td>
</tr>
<tr>
<td>Upper Peace</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>36,479</td>
<td>502,050</td>
</tr>
</tbody>
</table>
### Summary of Development and Operating Costs (based on Conceptual Design)

<table>
<thead>
<tr>
<th></th>
<th>Small Scale Facility</th>
<th>Medium Scale Facility</th>
<th>Large Scale Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design example size (tonnes/yr)</td>
<td>500</td>
<td>4,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Development and Equipment Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ($)</td>
<td>122,200</td>
<td>1,000,000</td>
<td>1,690,000</td>
</tr>
<tr>
<td>Per Tonne of Capacity ($/tonne)</td>
<td>244</td>
<td>250</td>
<td>113</td>
</tr>
<tr>
<td>Annual Operating Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ($)</td>
<td>25,000 to 30,000</td>
<td>90,000 to 100,000</td>
<td>150,000 to 175,000</td>
</tr>
<tr>
<td>Per Tonne of Capacity ($/tonne)</td>
<td>50 to 60</td>
<td>23 to 25</td>
<td>10 to 12</td>
</tr>
</tbody>
</table>
# Conceptual L&YW Infrastructure (estimate) by Geographic Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Drop/off transfer sites</th>
<th>New Class 2 and Class 3 Facilities</th>
<th>Expansion of Existing Facilities</th>
<th>Total Infrastructure Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Saskatchewan</td>
<td>$195,000</td>
<td>$475,000</td>
<td>$1,260,000</td>
<td>$1,930,000</td>
</tr>
<tr>
<td>South Saskatchewan</td>
<td>$180,000</td>
<td>$250,000</td>
<td>$17,400,000</td>
<td>$17,830,000</td>
</tr>
<tr>
<td>Red Deer</td>
<td>$75,000</td>
<td>$100,000</td>
<td>$1,575,000</td>
<td>$1,750,000</td>
</tr>
<tr>
<td>Lower Athabasca</td>
<td>0</td>
<td>$150,000</td>
<td>$875,000</td>
<td>$1,025,000</td>
</tr>
<tr>
<td>Upper Athabasca</td>
<td>$7,500</td>
<td>$575,000</td>
<td>$250,000</td>
<td>$832,500</td>
</tr>
<tr>
<td>Lower Peace</td>
<td>0</td>
<td>$125,000</td>
<td>$75,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Upper Peace</td>
<td>$37,500</td>
<td>$350,000</td>
<td>$500,000</td>
<td>$887,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$25 M</strong></td>
</tr>
</tbody>
</table>
Compost End Uses and Markets

• Data collected via questionnaire and follow up phone calls

• Contacted
  – composters and
  – potential/current end users of compost in each of the 7 regions

• Data potential market was supplemented with study from Iowa
## Estimated Compost Market Demand

<table>
<thead>
<tr>
<th>Region</th>
<th>Population</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Saskatchewan Total</td>
<td>1,281,139</td>
<td>210,107 m³/yr</td>
</tr>
<tr>
<td>South Saskatchewan Total</td>
<td>1,531,318</td>
<td>251,136 m³/yr</td>
</tr>
<tr>
<td>Red Deer Total</td>
<td>274,784</td>
<td>45,065 m³/yr</td>
</tr>
<tr>
<td>Lower Athabasca Total</td>
<td>131,786</td>
<td>22,613 m³/yr</td>
</tr>
<tr>
<td>Upper Athabasca Total</td>
<td>119,039</td>
<td>19,522 m³/yr</td>
</tr>
<tr>
<td>Lower Peace Total</td>
<td>41,291</td>
<td>6,772 m³/yr</td>
</tr>
<tr>
<td>Upper Peace Total</td>
<td>116,946</td>
<td>19,179 m³/yr</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,496,303</td>
<td>573,394 m³/yr</td>
</tr>
</tbody>
</table>
Feasibility Study – Part 2

Outstanding questions

- Economic & policy instruments to encourage diversion
- What are the funding models?
- GHG Offsets and impact on LYW diversion
- Recommended diversion rate, and monitoring, grant fund details

- Full Cost Accounting for the program
Economic & Policy Instruments

Policy tools for reducing disposal in landfill include

- Landfill tax or levy
- Differential tipping fees
- Mandated standards and regulations
- Disposal bans
- Mandatory source separation and recycling
- Mechanisms linked to permitting
Funding Models

• In Canada, only Quebec has funding program that targets L&YW and other organics
• Other jurisdictions: include organics in solid waste reduction initiatives
• Funding cost commonly comes from general revenue
• In Alberta, Waste Management Assistance Program and Resource Recovery Grant Program are currently under review and not accepting applications
GHG Offsets for Composting

• Composting facilities can claim GHG offsets through composting

• Current rate of offsets: $10 – 13.50 per t
• Cost of applying for credits for
  – quantifying emission reductions;
  – verifying claims; and
  – registering and trading offset credits

• Total potential for diverting all L&YW:
  644,900 t CO$_2$e or $7.58$ M per y
GHG Offsets for Composting

- Composting facilities can earn GHG offsets through composting
- Current rate of offsets: $10 – 13.50 per t
- Cost of applying for credits for:
  - quantifying emissions,
  - verifying claims,
  - registering and trading offset credits
- Total potential for diverting all L&YW:
  644,900 t CO₂e or $7.58 M per y

After final analysis, recommendation to not consider GHG offsets in determining policy options for L&YW diversion
Contractor Recommendations

- Differential tipping fees should be implemented at landfills
- Municipalities should implement programs to encourage participation
  - Bag limits
  - Tag-a-bag
  - L&YW Collection Bins
- Do not implement disposal bans at this time
Contractor Recommendations

- Two diversion targets for the province:
  - Moderate (~35% for province)
  - Aggressive (~55%)

<table>
<thead>
<tr>
<th>Town Population</th>
<th>Moderate</th>
<th>Aggressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 999</td>
<td>No target</td>
<td>No target</td>
</tr>
<tr>
<td>1000 - 2500</td>
<td>15%</td>
<td>40%</td>
</tr>
<tr>
<td>2500 – 9,999</td>
<td>15%</td>
<td>60%</td>
</tr>
<tr>
<td>10,000+</td>
<td>50%</td>
<td>80%</td>
</tr>
</tbody>
</table>
Contractor Recommendations

- Have levy on all MSW disposed in Class II and III landfills to develop grant program
  - Managed at arms length from GOA, by third party
  - Education awareness programs
  - Market development of beneficial products from L&YW
  - Have operator training
  - Link funding to verified records of beneficial products being produced
Next Steps

• Finish Full Cost Accounting

• Complete Leaf and Yard Waste Diversion Strategy

• Submit report to the Minister
Thank-you!

Natasha Page

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