Plastic Waste to Fuel

Presented by:
Jeff Gold
Nexus Fuels, LLC

Georgia Recycling Coalition - 2015
How It Began ....

The 1950's:
Wow! Plastic lasts FOREVER!!

TODAY:
AAAA!! Plastic lasts FOREVER!!

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The Problem

Million Tons of Plastic

- Global Consumption: 299
- US Post Consumer: 40
- Landfilled: 32.5
- Burned: 4
- Recycled: 2.8

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The Solution - Depolymerization

Breaking long-chain hydrocarbons (polymers) into smaller chains using heat.

- Methane
- Ethane
- Propane
- Butane (recycled in plant)

- Naphtha
- Gasoline
- Kerosene
- Light Diesel
- Heavy Diesel (trace sulfur)

- High Grade: Candles, Cosmetics, Fillers

- Sand
- Glass
- Metal
- Oxidized Orgs
- Carbon Black

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Plastic Contains Energy!

Source: University of Massachusetts Floriculture Fact Sheet – Alternate Heat Sources

Source: Proprietary to Nexus Fuels, LLC
System Inputs

- PETE
- HDPE
- PVC
- LDPE
- PP
- PS
- OTHER

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# Feedstock Sources

<table>
<thead>
<tr>
<th>Quality Type</th>
<th>#4 LDPE</th>
<th>#5 EPS/HIPS</th>
<th>#2 HDPE, #5 PS, #6 PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity T/D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price $/lb.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently</td>
<td>Landfilled $35/T + transport</td>
<td>Landfilled $38/T + transport</td>
<td>Landfilled $35-$100/T</td>
</tr>
</tbody>
</table>

Examples

**MRF**

**Sign Manufacturer**

**National Retailer**

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Feedstock Contaminants

- Paper
- Cardboard
- Plastic - PVC
- Metal
- Water
- Soil
- Garbage

Asphalt/Cement Additive
Soil Amendment (carbon)

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System Output

1 Ton

230 Gallons

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Efficiency, Quality High

- Hydro
- Coal
- Nexus Plastics to Fuel 30-60
- Oil Production
- Wind
- Nuclear (w/diffusion enrichment)
- Natural Gas
- Photovoltaic
- Shale oil
- Ethanol-Sugarcane
- Agilyx - Plastic to Fuel
- Bitumen tar sands
- Solar Flat Plate
- Ethanol-Corn
- Biodiesel

EROEI - Energy Returned Over Energy Invested

*Excludes energy needed for scrubbing outputs, Nexus outputs only H₂O and CO₂ (at low levels), no cleaning needed
Source: Various energy reports and company documents

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## End Uses

<table>
<thead>
<tr>
<th>Examples</th>
<th>Shippers</th>
<th>Manufacturers</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Shippers" /></td>
<td><img src="image2" alt="Manufacturers" /></td>
<td><img src="image3" alt="Other" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Type</th>
<th>Gasoline/Diesel</th>
<th>Kerosene, Waxes</th>
<th>Oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>Market Rates</td>
<td>$20-$30/Gallon, $0.50/lb. wax</td>
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Nexus Pilot Plant

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