Promoting RNG Development in Washington State

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What is Renewable Natural Gas...?
Dairy Digesters: Stable, Innovating, but Stalled
Landfills: Making Progress
Wastewater Treatment: Emerging Opportunities
## 2017 Roadmap: RNG Potential

<table>
<thead>
<tr>
<th>Source</th>
<th>Energy (MMBtu/yr)</th>
<th>Electricity (MWh/yr)</th>
<th>Fuel (DGE/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfills</td>
<td>16,519,219</td>
<td>1,738,865</td>
<td>122,364,586</td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>1,716,062</td>
<td>180,638</td>
<td>12,711,571</td>
</tr>
<tr>
<td>Dairies</td>
<td>3,011,250</td>
<td>316,974</td>
<td>22,305,566</td>
</tr>
<tr>
<td>Food Processing &amp; Municipal Organics</td>
<td>5,430,198</td>
<td>571,600</td>
<td>40,223,692</td>
</tr>
<tr>
<td>Urban Wood Gasification</td>
<td>23,376,197</td>
<td>2,460,652</td>
<td>173,157,015</td>
</tr>
</tbody>
</table>

**Current:** 8-9% power and direct use, ~20% diesel consumption  
**Advanced:** 16-17% power and direct use, ~37% diesel consumption
2017 Roadmap: Key Findings

Power Sales Model Mature
- Utility RPS targets met
- RNG market moving to transportation

Incentives Need an Overhaul
- Previous tax breaks expired
- Definitions dated, conflicting, incomplete

Pipeline Quality Standards

Uncertain Policy Framework
2018 Legislation (HB 2580)

- Restore and expand production incentives
- Broader techno-economic assessment
- Update policy options
- Public sector preferential purchasing
- Regional voluntary pipeline standards
2018 Roadmap: Promoting RNG

• Refine previous production estimates
• Cite economic and environmental benefits
• Integration with natural gas utilities
• Policy options, especially incentives

First Step: Better data, focus on pipelines

- Facilities within 5 miles
- Feedstocks within 30 miles
- Public-private partnerships, priorities for public funding
- Data sets dated, incomplete and/or inferred
Start with the larger dairies...
...add dairies in close proximity to other dairies...
...other sources of animal waste...
...don’t forget hatcheries...
...fruit growers, brewers and distillers...
...and plenty of food processors

Food Processors
- High sales volume or employment (high energy value)
- Medium sales volume or employment

Other processors

Source: Washington State Energy Office
Facilities start with wastewater...
...add open landfills...
...and composters, other public infrastructure
High Volume Animal Waste

Source: Washington State Energy Office
High Volume/Value Food Processors
(relative to wastewater treatment with AD)

Source: Washington State Energy Office
2018 Roadmap: RNG Potential

**Current** (Cedar Hills LF, Roosevelt LF, South WWTP): **1.3%**
- All currently “wheeled” into California CNG transportation market

**Near-Term** (~5 years, ~$680 million CAPEX): **1.8%**
- One LF, two WWTPs, and eight dairies generating power converted to RNG
- Three landfills in Chelan, Cowlitz and Yakima counties
- Nine WWTPs w/digesters in Benton, Clark, Grant, King, Snohomish, Spokane and Yakima counties
- 19 additional dairies statewide (primarily Yakima, Grant/Adams and Whatcom counties)
- 50% of post-consumer organic wastes in King, Snohomish and Pierce counties

**Medium-Term** (5-10 yrs): **1.9%**
- Five landfills in Asotin, Benton, Grant, Yakima and Walla Walla counties
- 27 WWTPs, nine of them (including Post Point) upgraded with digesters
- ~200 dairies with adequate biogas potential
- Balance of post-consumer organic wastes from central Puget Sound, plus food waste for next 14 counties with highest RNG potential
- Significant diversion of food processing residuals, AD added to composters
New Initiatives

• **Natural Gas Conservation Standard:** Gas utilities identify and acquire all available and cost-effective measures; UTC to establish targets by 2022

• **RNG Programs:** Utilities may propose RNG program for compliance, must offer voluntary RNG service

• **Low-Carbon Fuel Standard:** State vs Puget Sound

• **Public Preferential Purchasing:** RNG and nutrients

• **State-level Pipeline Standards:** UTC exploration

• **Clean Energy Fund:** $1m Dairy Digester Grants

• **Food Waste Reduction Plan:** 2020
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