City of Gresham:

FOG Phase II / Cogen Expansion

Renewable Energy Advisory Council:
November 20, 2013

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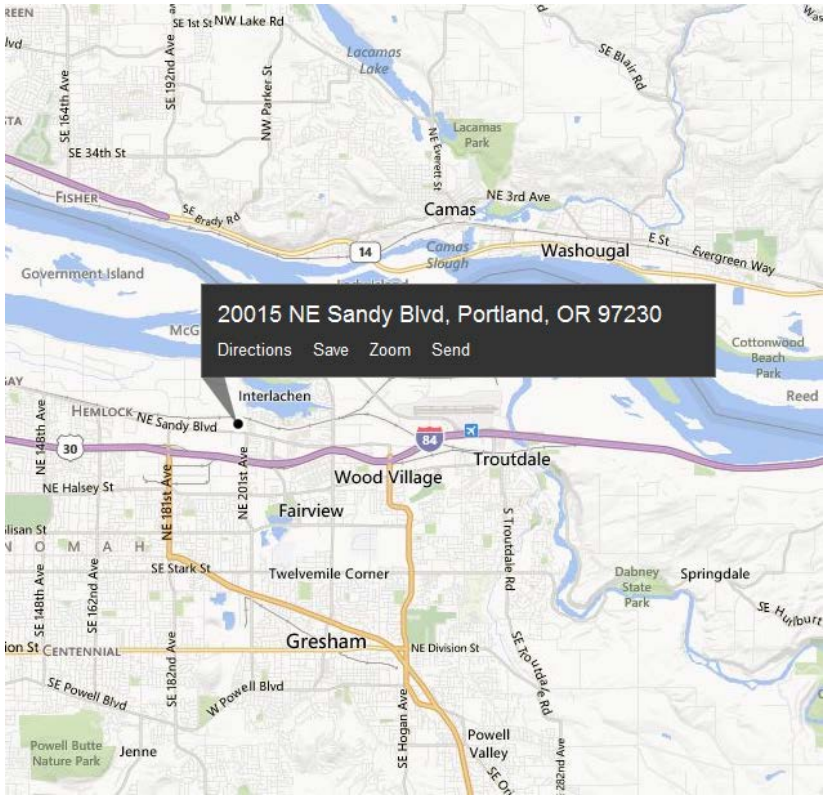
Overview

- Location
- Support for biopower at WWTPs
- Project description
- Co-digestible feedstocks
- Generation / Costs / O&M / Revenues / Financing
- Above-market cost
- Proposed incentive

Location – Gresham, Oregon



Background

- Strategic biopower opportunity
  - Municipality
  - Load ~ 5,500 MWh / year.
- Gresham's goal: energy independence
- 2005: 395 kW cogen engine
- 2009: Brown Grease *Feasibility Study*
- 2012: Brown grease receiving & processing facility installed
- Feedstock contracts in place

Project Summary

- Owner: City of Gresham
- Project cost: $2,718,683
- Components:
  - Additional 395 kW cogen engine
  - Second brown grease (FOG) storage tank
  - New standby generator
  - Modifications to electrical and hot water systems
- Proposed incentive: $330,000

Biogas Feedstock

- Operation contingent upon sufficient volume of co-digestible materials.
- Planning to secure over 12,000 gallons / day of brown grease.
- Brown grease (FOG) “tipping fees”
  - $0.08 / gallon
  - Three-year supply contracts
- 30,000 gallon brown grease storage capacity.

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Estimated Generation

- New cogeneration system and solar could generate more electricity than plant needs.
  - Load: 5,500 MWh/yr.
- Present generation:
  - ~ 3,000 MWhs / year from existing cogen engine
  - ~ 450 MWhs from solar
- Modeled project limited generation to 2,100 MWhs / yr.

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Development Schedule

- Construction bid in January 2014; construction Q1 2014
- Interconnection agreement from PGE in place; project will net meter
- No off-site transmission system improvements needed
- Commercial operation fall 2014

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Revenue & Costs

- Modeled as a 20-year project
- Off-set retail rate: $0.06732 (2014)
- Interconnection Agreement will allow export of power
- Brown grease tipping fees
  - 6,000 gal / day for 20 years
  - ~ $130,000 / year
- O&M: ~ $0.030 / kWh plus engine overhauls & FOG station maintenance

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Project Costs

Engineering / Design / Const. Mngt.	$	650,635
Cogen Engine System	$	545,000
Contingency	$	336,997
Electrical, Mechanical, Standby Gen.	$	752,989
Brown Grease Receiving Station	$	433,062
Total	$	2,718,683

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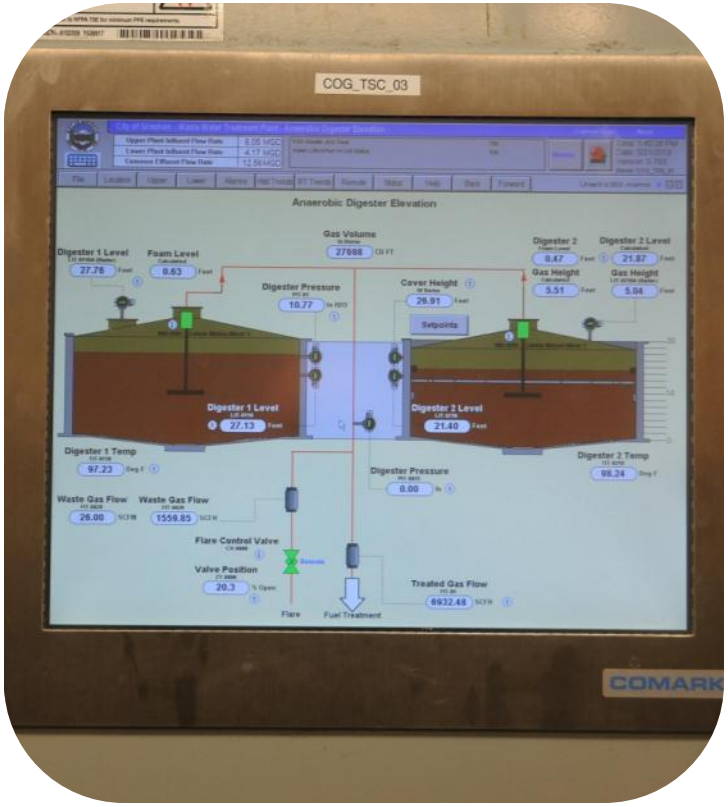
Project Financing

- Equity from Capital Improvement Budget; no borrowing
- ODOE Combined Heat and Power (CHP) tax credit → $1,011,774 pass through value



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Financial summary (NPV basis)

ETO assigned project risk adjusted rate of return	8.0%	
Project Cost		
Total Design & Construction	$	2,718,683
Debt	$	-
Grants	$	-
Equity	$	2,718,683
Revenue		
NPV Revenues	$	3,807,924
NPV Energy Trust Subsidy	$	-
NPV Total Revenues	$	3,807,924
Expense		
NPV Total Project Expense	$	1,433,590
NPV Total Project Taxes	$	-
NPV of interest payments for all loans	$	-
NPV of principal payments for second loan	$	-
NPV of principal payments	$	-
Total: Equity, Principal Payments, Expense, Taxes, Interest	$	4,152,273
(Above Market) / Below Market Cost of Power From Cash Flows	$	(344,349)

Proposed incentive

Above Market Cost (NPV):	$344,349
<u>Suggested Incentive</u>	
Suggested Incentive:	$330,000
Payment Terms:	Two payments: $165,000 upon commissioning; $165,000 twelve months later based on generation threshold
REC Allocation:	37,800 (90%)
PUC measure	$8.73 / REC
($) / aMW (straight-line)	$1.38 MM

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Comparison with other biopower projects

Project	$ (MM) / aMW
City of Medford	$0.77
Gresham Cogen / FOG Phase II	$1.38
JC-Biomethane	$1.39
CWS - Durham	$2.13
City of Pendleton	$2.68

Risks & Strengths

Risk:

- Minor risk: insufficient brown grease tipping fees

Strengths:

- Off-setting retail rate creates significant incentive
- Already secured almost 12,000 gallons / day.
- System designed for greater future volumes of waste and generation

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City of Gresham Mayor Shane Bemis

Portland Tribune, November 14, 2013

"We are proud of our environmental track record in a number of areas. But to be honest, many of our choices are motivated as much by the color of money as they are by our environmental stewardship ethic."

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