



## **WTD Biogas Systems 101: Biogas Use, Sales and Revenues**

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 **King County** | Resource Recovery

# AGENDA

1. Brief Overview: Biogas from Wastewater
2. WTD's Uses of Digester Gas
3. Environmental Attributes of Renewables - What are RECs, RINs, e-RINs, T-RECs?
4. Summary
5. Q&A

*Harnessing valuable resources that would otherwise be lost.*

# BRIEF OVERVIEW: BIOGAS FROM WASTEWATER

- **“Free” resource - we already make it**
- **Environmental benefits**
  - Creates renewable energy
  - Offsets fossil fuel use
  - Reduces greenhouse gas (GHG) emissions
- **Financial benefits**
  - Either saves on operating expenses or generates revenue

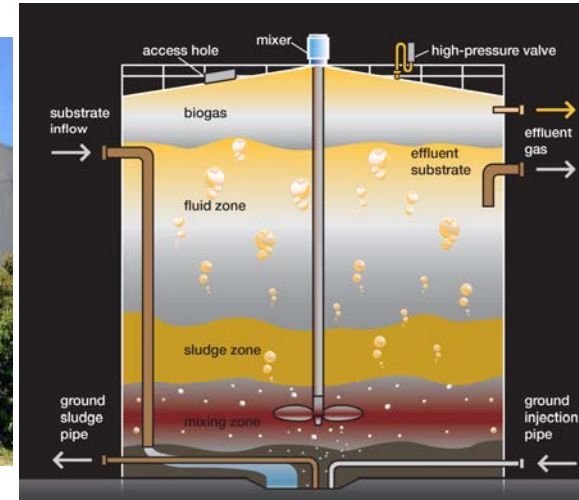


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# BRIEF OVERVIEW: BIOGAS FROM WASTEWATER

## What's it made of?

- 66% methane ( $\text{CH}_4$ )
- 32% carbon dioxide ( $\text{CO}_2$ )
- 2% other components ( $\text{H}_2\text{S}$ , siloxanes)



## How is it processed?

1. Capture
2. Compress
3. "Clean"
4. Use/Sell

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# WTD'S USES OF DIGESTER GAS – WEST POINT

1. Raw Sewage Engines
2. Boiler
3. Cogeneration (to sell green electricity)
4. *Near future: Microturbine demonstration*
5. *Beginning discussions on replacement of cogen at end-of-life*



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# WTD'S USES OF DIGESTER GAS – SOUTH PLANT

1. Gas scrubbing towers (to sell gas as transportation fuel)

2. Near future:

*Installing flash tank to capture more gas*



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# WTD'S USES OF DIGESTER GAS – BRIGHTWATER

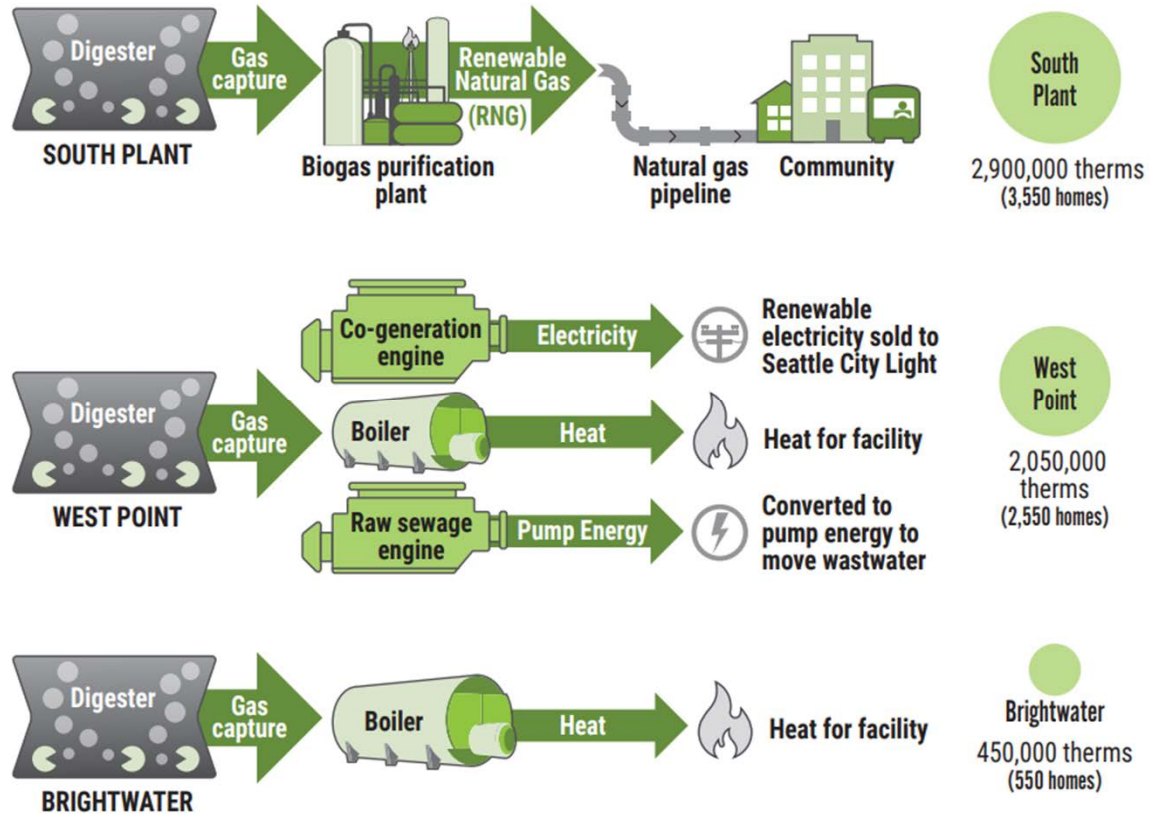
1. Boiler

2. *Near future: RFQ for private partner to purchase raw biogas, and invest private capital to eliminate existing flared gas*



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# WTD'S USES OF DIGESTER GAS - SUMMARY



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# ENVIRONMENTAL ATTRIBUTES OF RENEWABLES

What are RINs, RECs, eRINs, T-RECs, etc?

- **REC** – Renewable Energy Certificate  
*Green Power (electricity)*
- **RIN** – Renewable Identification Number  
*Renewable Natural Gas*
- **eRIN** – Electric Renewable Identification Number  
*Green Power (electricity)*
- **T-REC** – Thermal Renewable Energy Certificate  
*Renewable Heat*



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# REC

Renewable Energy Certificate

- The most established of all environmental credits
- Created in late 1990s to promote renewable energy and market share
- Totally voluntary
- Peak value around 2010, when demand outpaced supply
- 1 REC = 1,000 kWh



**West Point Cogen**

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# RIN

Renewable Identification Number

- Promote use of renewable fuels & reduce GHG emissions in transportation sector
- Regulatory requirement for petroleum refiners and importers
- EPA sets annual fuel blending requirements for petroleum refiners & importers
- Created through Renewable Fuel Standard (RFS) under Energy Policy Act of 2005
- 1 RIN = energy content in 1 gallon of ethanol
- Not a voluntary market—so prices are higher



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**South Plant Gas Scrubbing**

# E-RIN

Electric Renewable Identification Number

- Same thing as a gas RIN—meant to offset diesel or gasoline use in transportation sector
- Intended for electric vehicles—personal vehicles, buses, trains, trucks, etc.
- **No real pathway created yet.** Excluded from recent EPA rulemaking to set 2024 threshold requirements for refiners and importers
- 1 e-RIN = 1,000 kWh



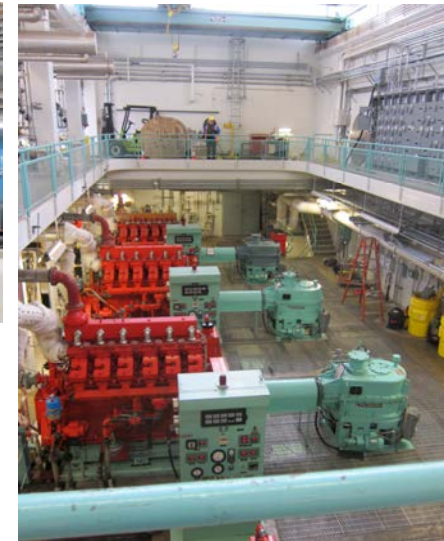
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**West Point & Brightwater**

# T-REC

## Thermal Renewable Energy Certificate

- Same concept as a REC, but for renewable heat
- Heat from cogen, boilers, raw sewage engines, raw sewage heat recovery, solar thermal
- Created by Washington State 2019 Clean Energy Transformation Act
- T-RECs are a source of renewables which WA electric utilities can use to help fulfill GHG neutrality requirements under RCW 19.405.040
- 1 T-REC = 3,412,000 BTUs (or 1,000 kWh)
- Currently solids from municipal wastewater are not included in the rule definition, so **WTD doesn't qualify for T-RECs.**



**West Point, South Plant, Brightwater**

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# SUMMARY

<u>Facility</u>	<u>Method</u>	<u>Current Incentive</u>	<u>Likely Future Incentives</u>
West Point	Cogeneration	RECs (~\$1.5M/yr)	RINs or e-RINs, and T-RECs
South Plant	Gas Scrubbing	RINs (~\$5-9.5M/yr)	RINs and T-RECs
Brightwater	Boiler	N/A	RINs or e-RINs, and T-RECs
Sewer Heat Recovery	N/A	N/A	T-RECs

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# Questions?

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**King County**

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