

190334

working for clean rivers

Amend contract with HDR Engineering, Inc. for additional support services for the Columbia Boulevard Wastewater Treatment Plant (CBWTP) Renewable Natural Gas Facility, BES Project No. E10033

Council Item 164

Vu Han, P.E. | Project Manager |
Paul Suto, P.E. | Engineering Manager |
Bureau of Environmental Services
March 17, 2021



ENVIRONMENTAL SERVICES
CITY OF PORTLAND

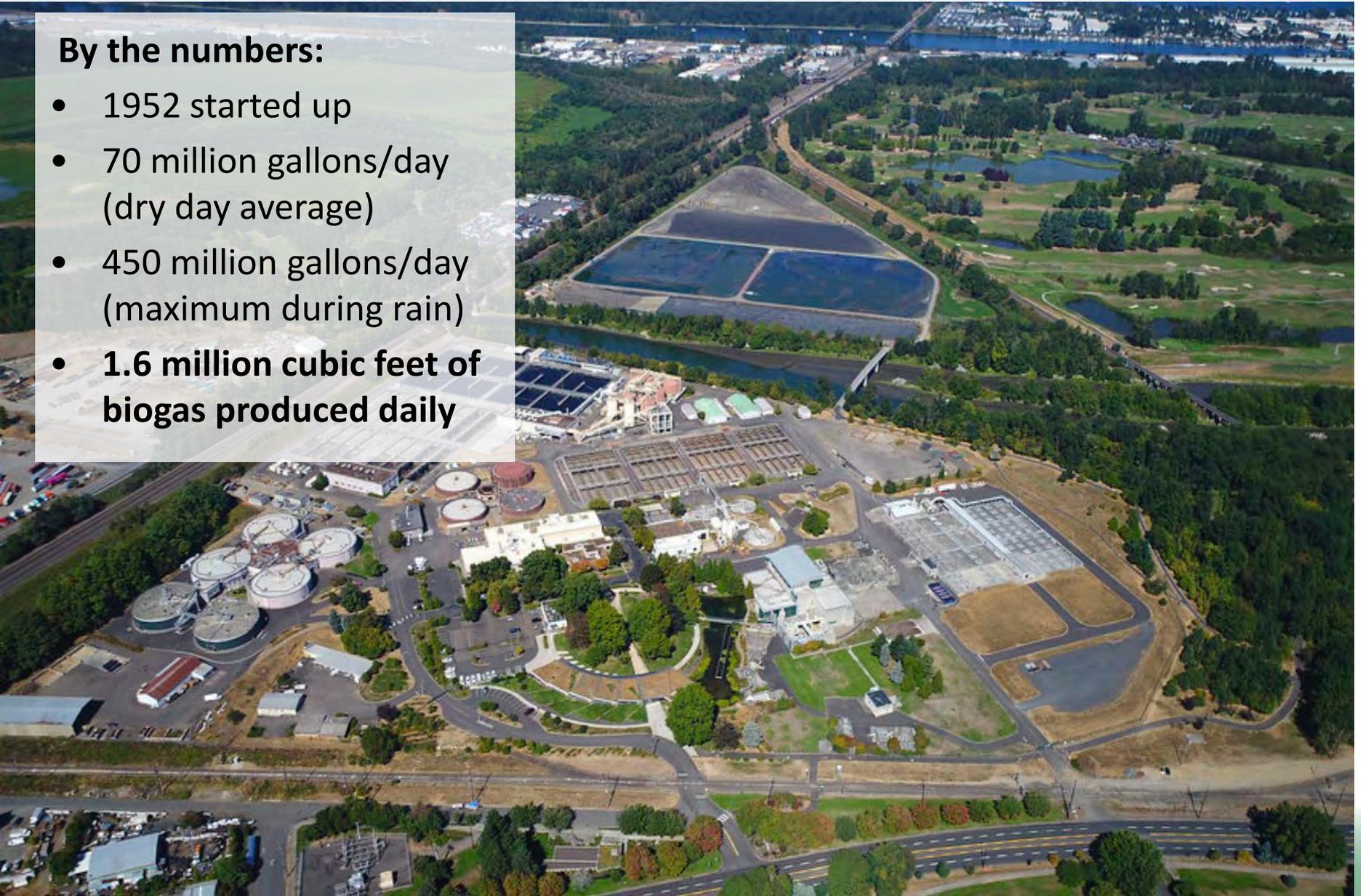
MINGUS MAPPS, COMMISSIONER
MICHAEL JORDAN, DIRECTOR



Overview: Wastewater treatment plant

By the numbers:

- 1952 started up
- 70 million gallons/day (dry day average)
- 450 million gallons/day (maximum during rain)
- **1.6 million cubic feet of biogas produced daily**



Poop to Power: 3 benefits of BES' RNG production



CLIMATE

Cut
greenhouse gas
emissions by
21,000 tons annually.



REVENUE

Generate
upwards of \$3 million
in revenue a year
for the city.



CLEAN AIR

Replace
1.34 million gallons
of dirty diesel truck fuel
with clean RNG per year.



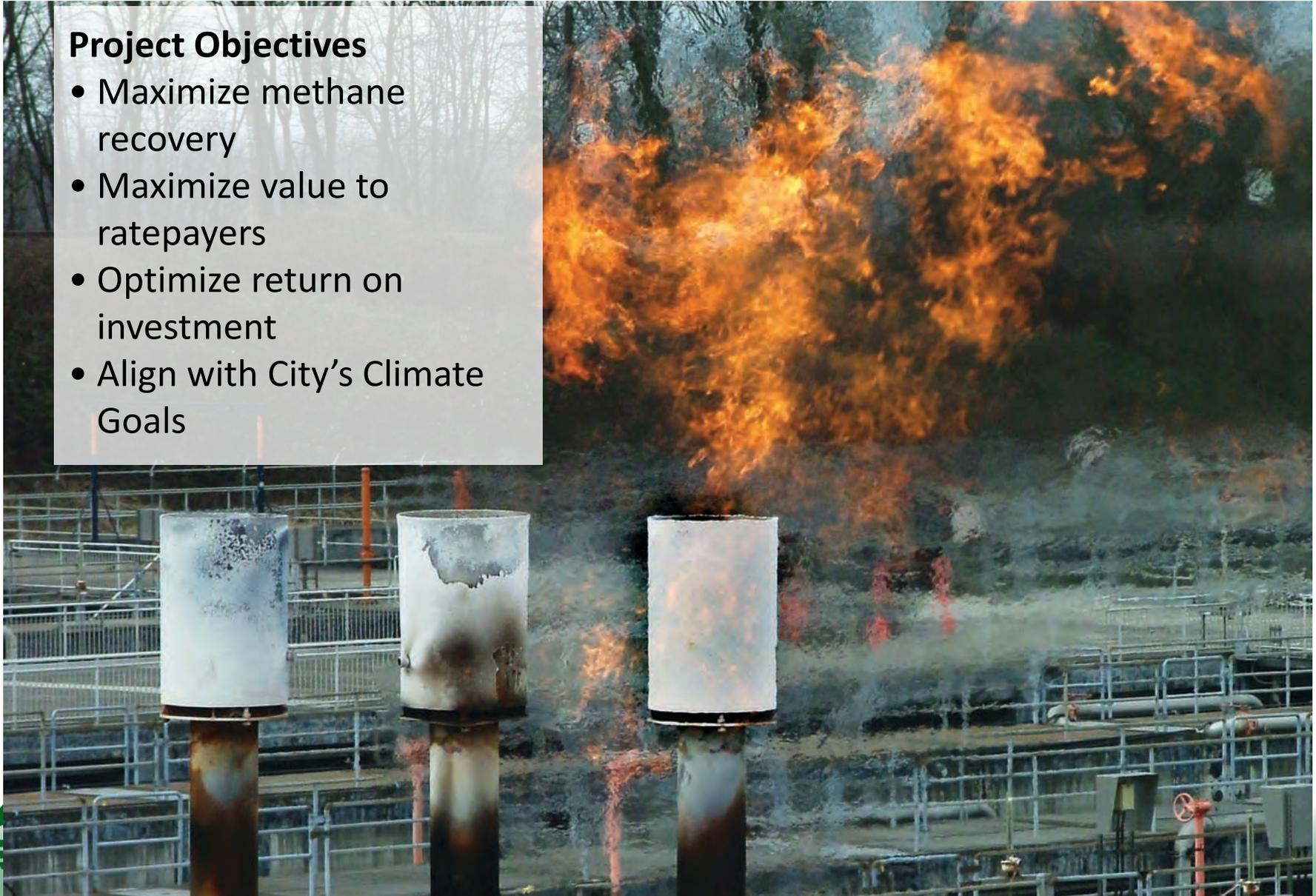
CNG Fueling Station Opening- March 2018



Maximize energy recovery. Minimize flaring

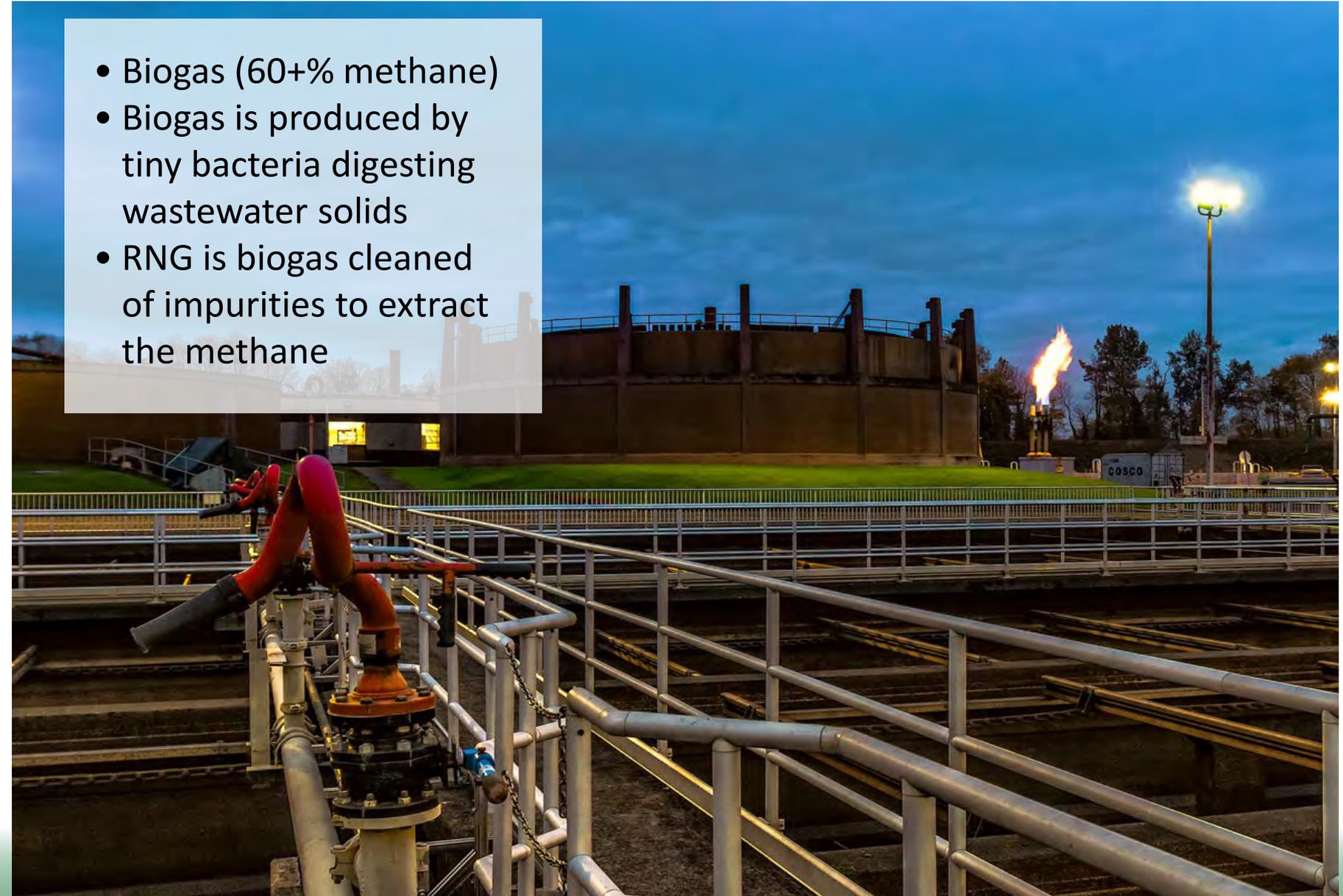
Project Objectives

- Maximize methane recovery
- Maximize value to ratepayers
- Optimize return on investment
- Align with City's Climate Goals

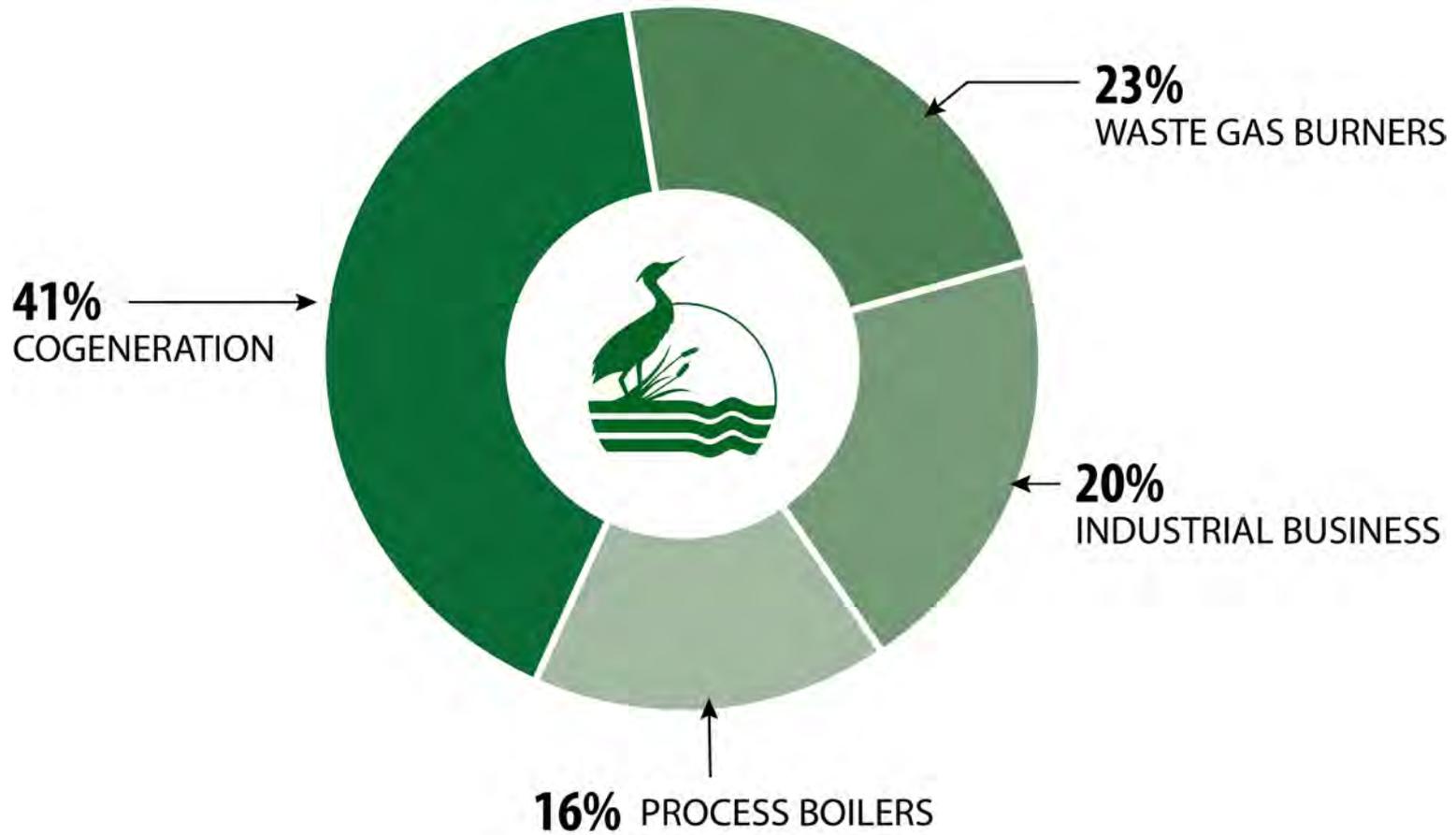


What are Biogas and Renewable Natural Gas ?

- Biogas (60+% methane)
- Biogas is produced by tiny bacteria digesting wastewater solids
- RNG is biogas cleaned of impurities to extract the methane

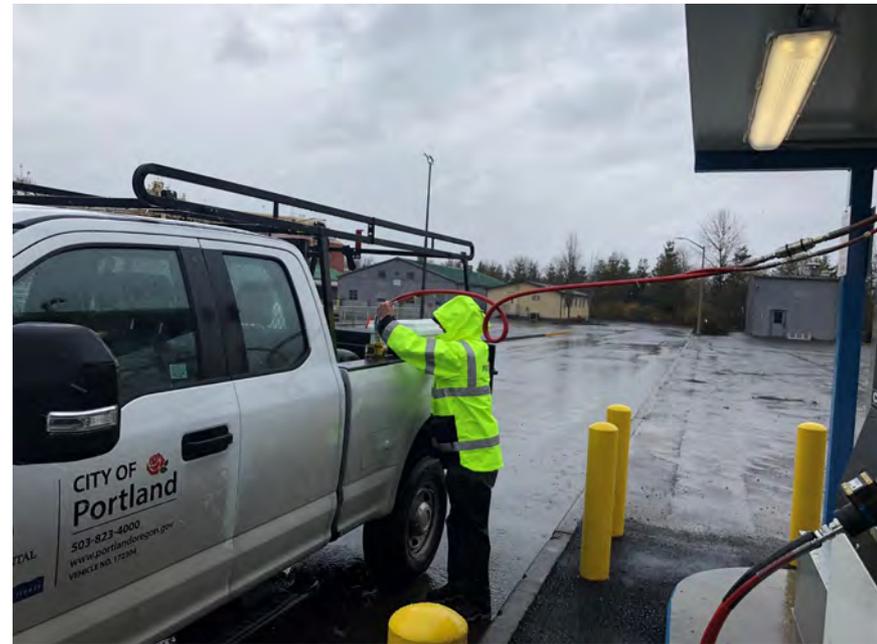


Current CBWTP Biogas Utilization



Aligns with City Climate and Energy Goals

- Climate Action Plan
 - Reduce carbon (CO₂) emissions by 40% compared to 1990 levels by 2030.
 - Reduce carbon emissions of transportation fuels by 20%
- Renewable Energy Goals
 - City Transportation Sector fueled by 100% renewable fuels by 2050

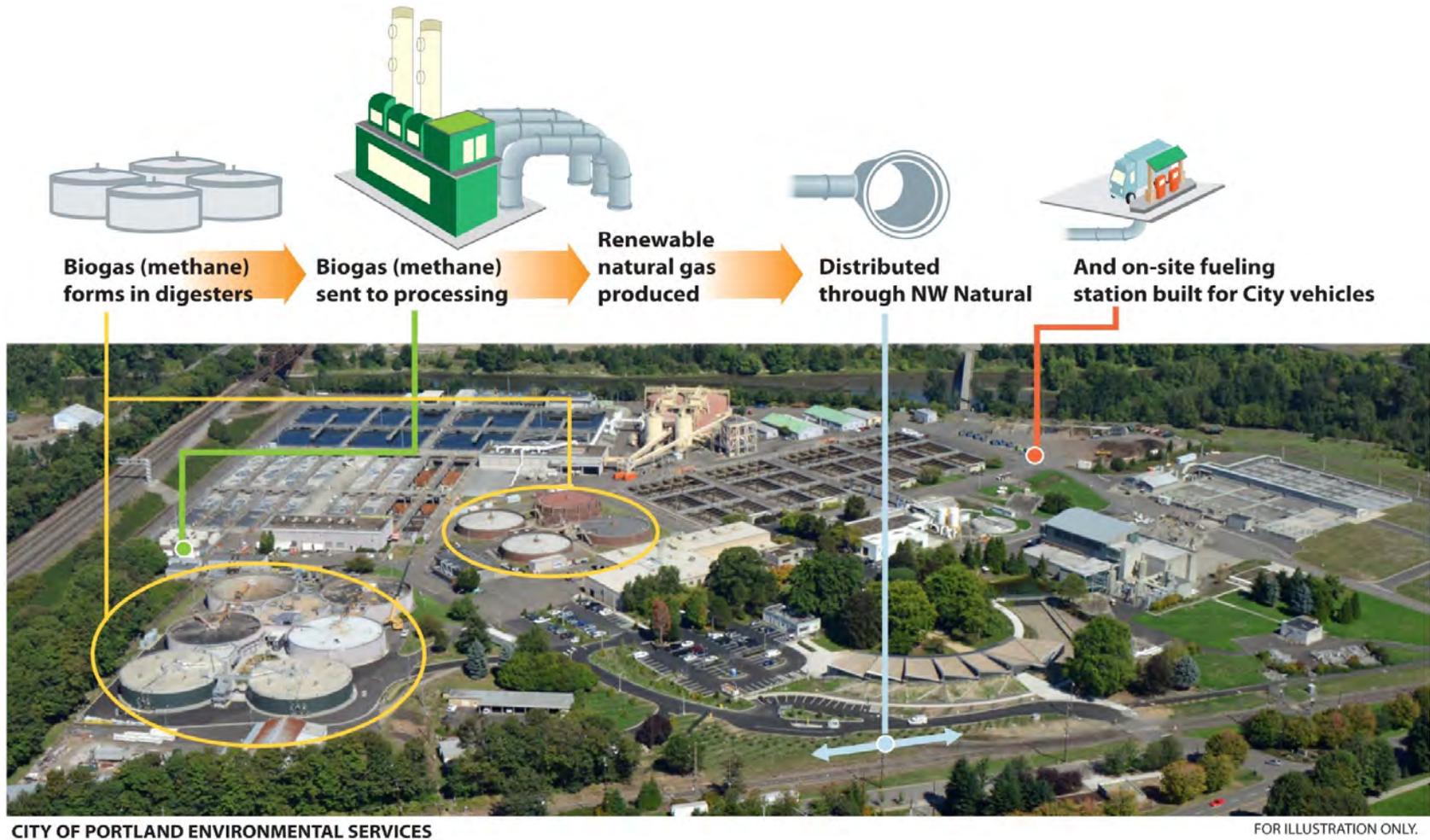


Aligns with City Goals for Clean Air

- City's Comprehensive Plan
 - Policy 7.5 Air Quality
 - Improve air quality, reduce exposure to air toxics and criteria pollutants
- Solid Waste and Recycling City Code 17.102.050 for Clean Fleet Truck Requirements
 - Places restrictions on diesel vehicles, CNG vehicles are exempt (clean burning fuel)



How “Poop to Power” is Being Built





ENVIRONMENTAL SERVICES
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Columbia Boulevard Wastewater Treatment Plant Campus

Fueling Station
Renewable Compressed
Natural Gas

Organic Waste Receiving Facility
Food Waste Slurry and
Fats, Oils, & Grease

NW Natural Receipt Facility

Production Facility
Renewable Natural Gas

Existing NW Natural Main

190334

NW Natural

Custody Transfer

Environmental
Services

Biogas (Methane) to Renewable Natural Gas Facilities

COLUMBIA SLOUGH

WT 1910 AUG 2019



Biogas Water Scrubber



Other Key Equipment



RTO (Regenerative Thermal Oxidizer)



Booster Compressor



Current Financial Projections

Projected Revenue:

\$3,000,000 to \$8,000,000 annually

ODOE Tax Credit: \$319,601

Simple payback at current prices: 5 years

(payback still within range of 4 to 8 years)

Costs

RNG Production Facility	\$20,093,440
NWN Interconnection*	\$778,850
RCNG Fueling Station**	\$1,878,467
Total Cost	\$22,750,757

* Funded by Operating; excluding \$1,168,715 on margin to be paid by accumulated credits from natural gas purchase

** Funded by Operating; recovery cost at end of 10 years per NWN Schedule H



Construction Status

- Final stages of construction.
- Current amount earned of the McClure and Sons, Inc. contract is \$12,010,974.
- HDR Amendment needed for effective completion.



Testing phase: unforeseen event

- August 2020: RNG facility startup testing
 - RNG successfully produced, overall system performs well.
- October 2020: The *vacuum pressure swing absorption* (VPSA) system ready for testing after delays due to COVID-19.
- November 2, 2020: VPSA testing began
 - A sudden over-pressurization led to a rupture of piping and damage to equipment.



Contract Amendment No 8 Scope

- Incident Support (Investigation)
- Hazard and Operability (HAZOP) Reassessment
- Design Changes to Gas Treatment System Tail Gas and VPSA Off Gas Stream
- Design of Submetering for Natural Gas and Power and Dedicated High Pressure Air Compressors



HDR Contract Amendment (No. 8)

Original Contract Amount	\$298,600	Pre-design Phase
Amendment No. 1	\$0	Add a State Certified ESB Subconsultant to Contract
Amendment No. 2	\$995,410	Final Design, Bidding, Construction Services
Amendment No. 3	\$0	Time Extension
Amendment No. 4	\$222,800	Additional Construction and Start Up Services
Amendment No. 5	\$0	Time Extension Only
Amendment No. 6	\$229,000	Additional Construction Support Services
Amendment No. 7	<u>\$0</u>	Time Extension
Current Contract Amount:	\$1,745,810	
Amendment No. 8	<u>\$283,039</u>	Additional Support Services
Revised Contract Amount:	\$2,028,849	

M/W/ESB Participation

Current: 20.0%

Revised: 19.7%



D/M/W/ESB Participation

Firm	Amendment No. 8	Total
MEC Electrical Engineering (ESB)	\$37,150	\$264,496
Akana (Formerly Cascade Design) (DBE/MBE)	\$13,424	\$74,725
Barney and Worth (WBE)	\$0	\$54,060
Campus Biogas (ESB)	\$0	\$6,094
	\$50,574	\$399,375

D/M/W/ESB participation as % of total contract amount

19.7%

