



Hamilton

The Emerging Field of Renewable Natural Gas Clean Air Council

October 27, 2017

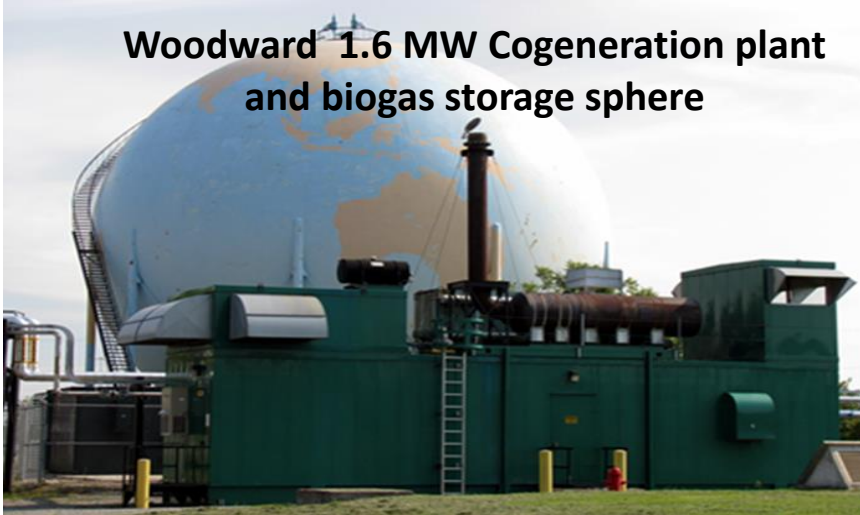
Office of Energy Initiatives

- Corporate Energy Policy - Council Mandate 2005
- Manage energy consumption and cost
 - Manage commodities purchasing
 - Plan, build and implement conservation initiatives
- Successful in achieving targeted results in 2013
- Targets set for short term and long term planning
- Manage operations of Hamilton Renewable Power Inc.

Year	Energy Policy Reduction Target	Emission Reduction and Offset Target
2020	Initial 20% (2005 as base year)	20%
2030	45%	50%
2050	60%	80%

Renewable Energy Portfolio

**Woodward 1.6 MW Cogeneration plant
and biogas storage sphere**



250 KW PV Solar



Glanbrook 3.2 MW landfill gas generators



Biogas Purification Unit



Glanbrook Landfill Site



- Started operations in 1981
- Current waste footprint: 104 acres
- Approved waste footprint area: 156 acres

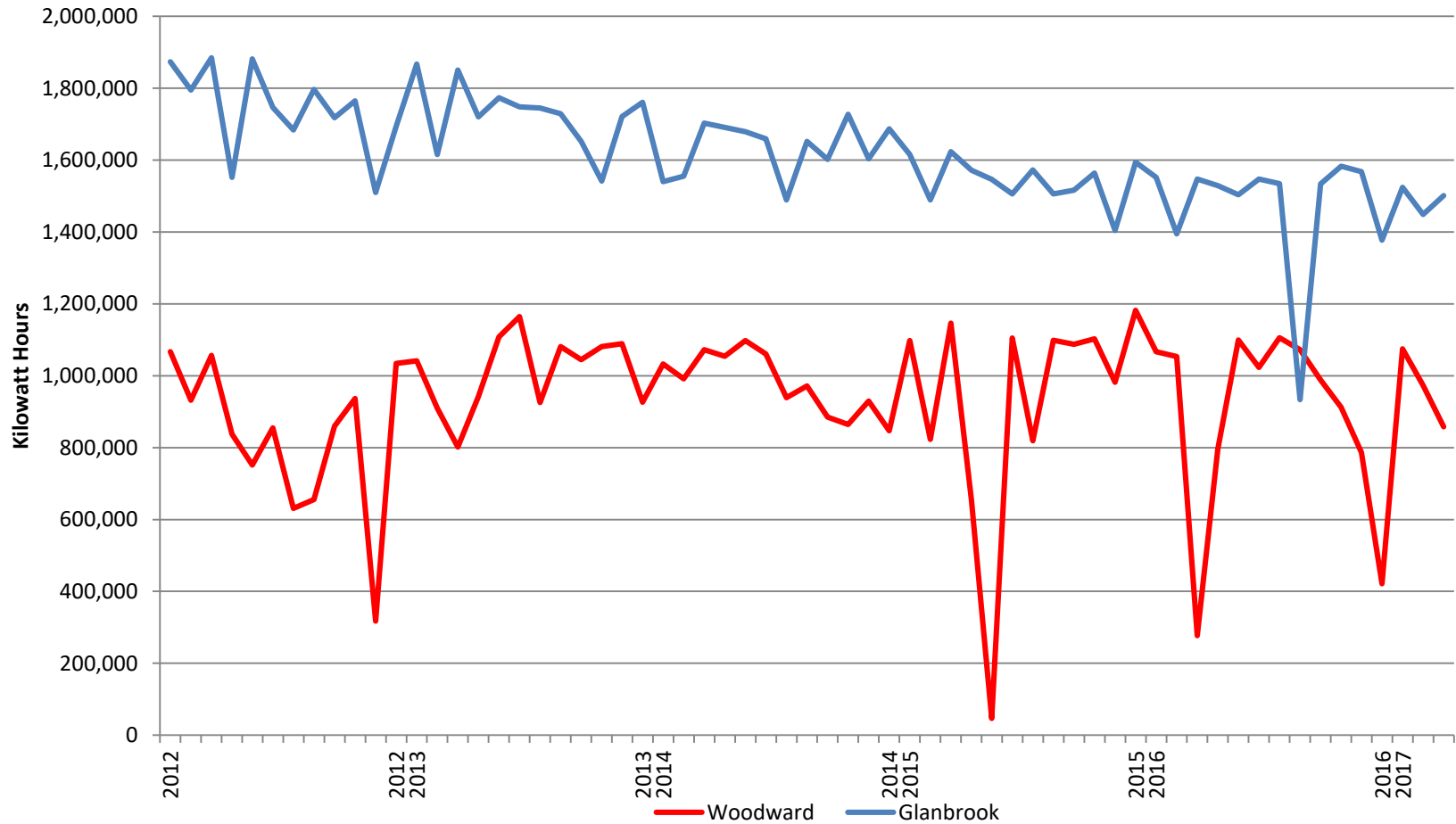
Glanbrook Landfill Project Highlights



Hamilton Water Cogeneration Plant



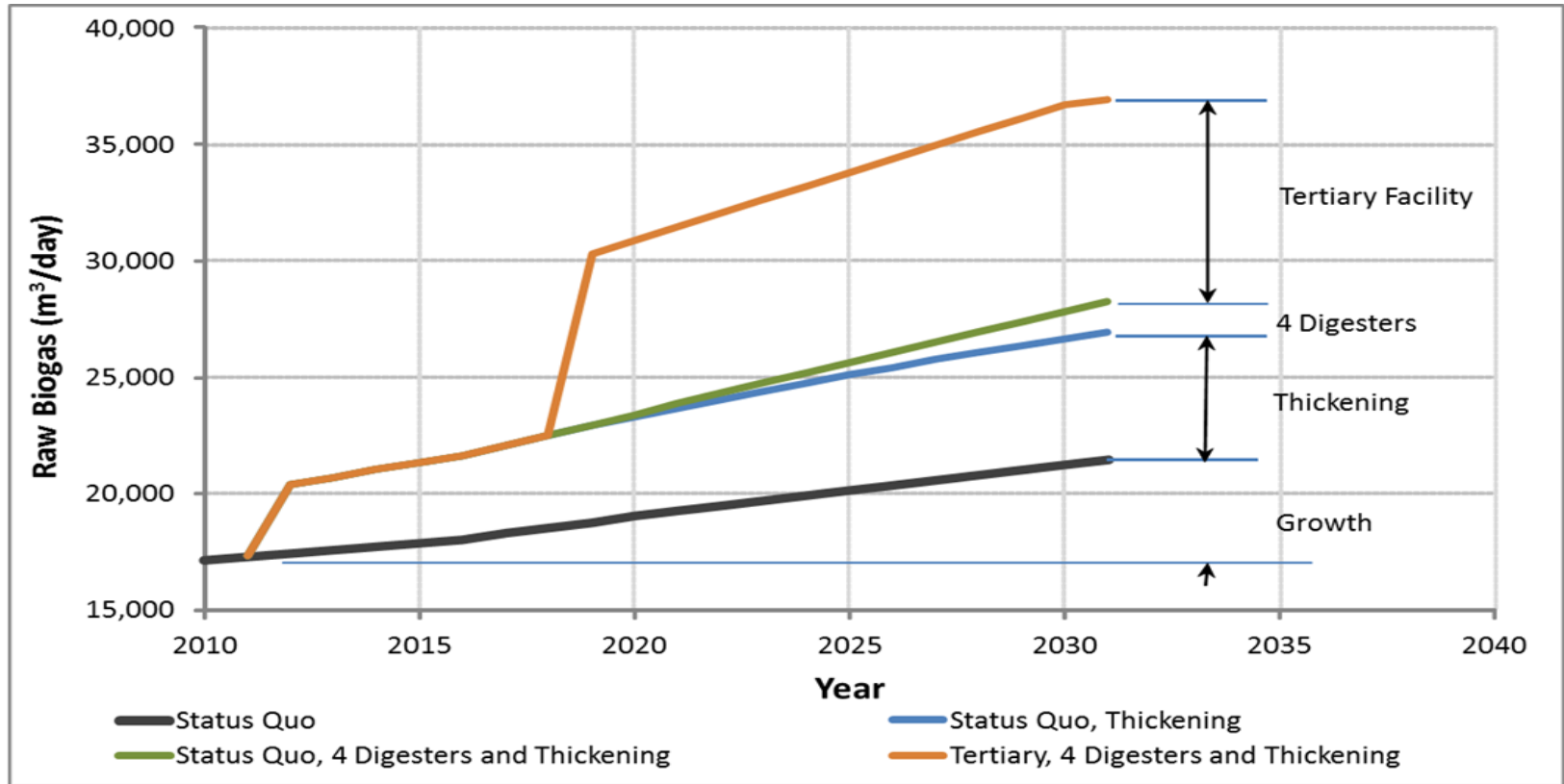
Electricity Generation from Biogas



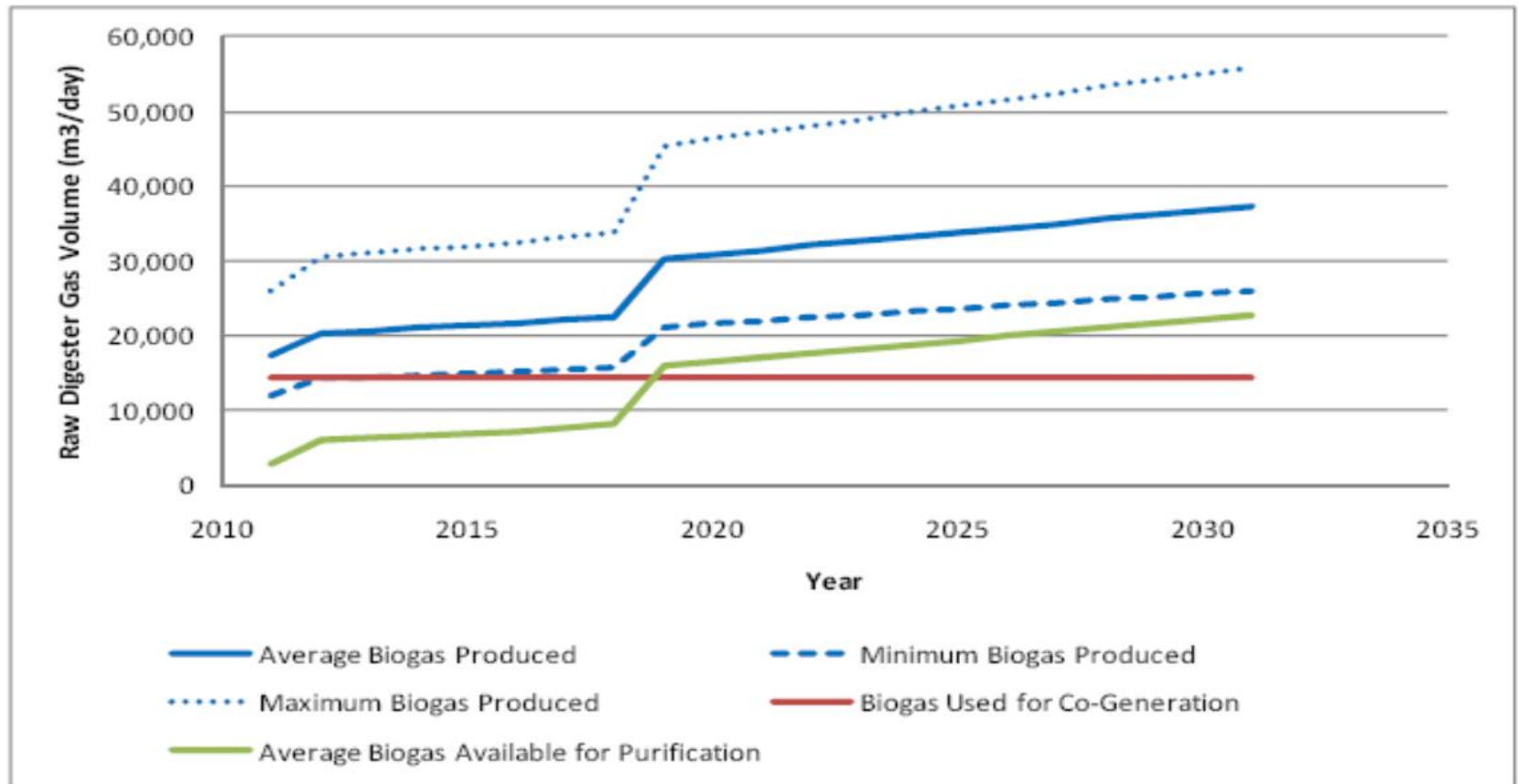
Woodward Biogas Enhancement & Digester Upgrade



Predicted Biogas Production



Biogas Production Forecast



The Biogas Purification Unit

- Water Scrubbing Technology selected
- Ability to process up to 10,000 cubic meters RNG/day (equivalent of heating 1200 homes)
- Inject to Union Gas distribution grid
- Gas quality monitored at the Biogas Purification Unit (BPU) and Union Gas meter station

Biogas Purification Unit



Biogas Purification Unit



Other Considerations

- ECA - Emissions and Noise
- Gas Producers Contract – M13
- Service Contract – OEM parts and inventory
- O&M Contract – Daily operations and maintenance
- Gas consultant – Daily nominations and storage position

Renewable Natural Gas

- In partnership with Union Gas, the City completed a new (CNG) station at the Mountain Transit Centre
- In September 2015, 18 new CNG - buses were added, bringing the fleet of CNG buses to 48.
- An additional 80-100 CNG buses are expected to be added over the next 3 years.
- Contribution of RNG to Transit will enhance GHG profile as applied.



Hamilton – City of Waterfalls

Thank
You



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