

Biomass Thermal and Renewal Natural Gas Opportunities

Bio-Heat Community of Practice Workshop
Thunder Bay
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Industries that we have heating Metrics - HEAT LOAD FACTORS

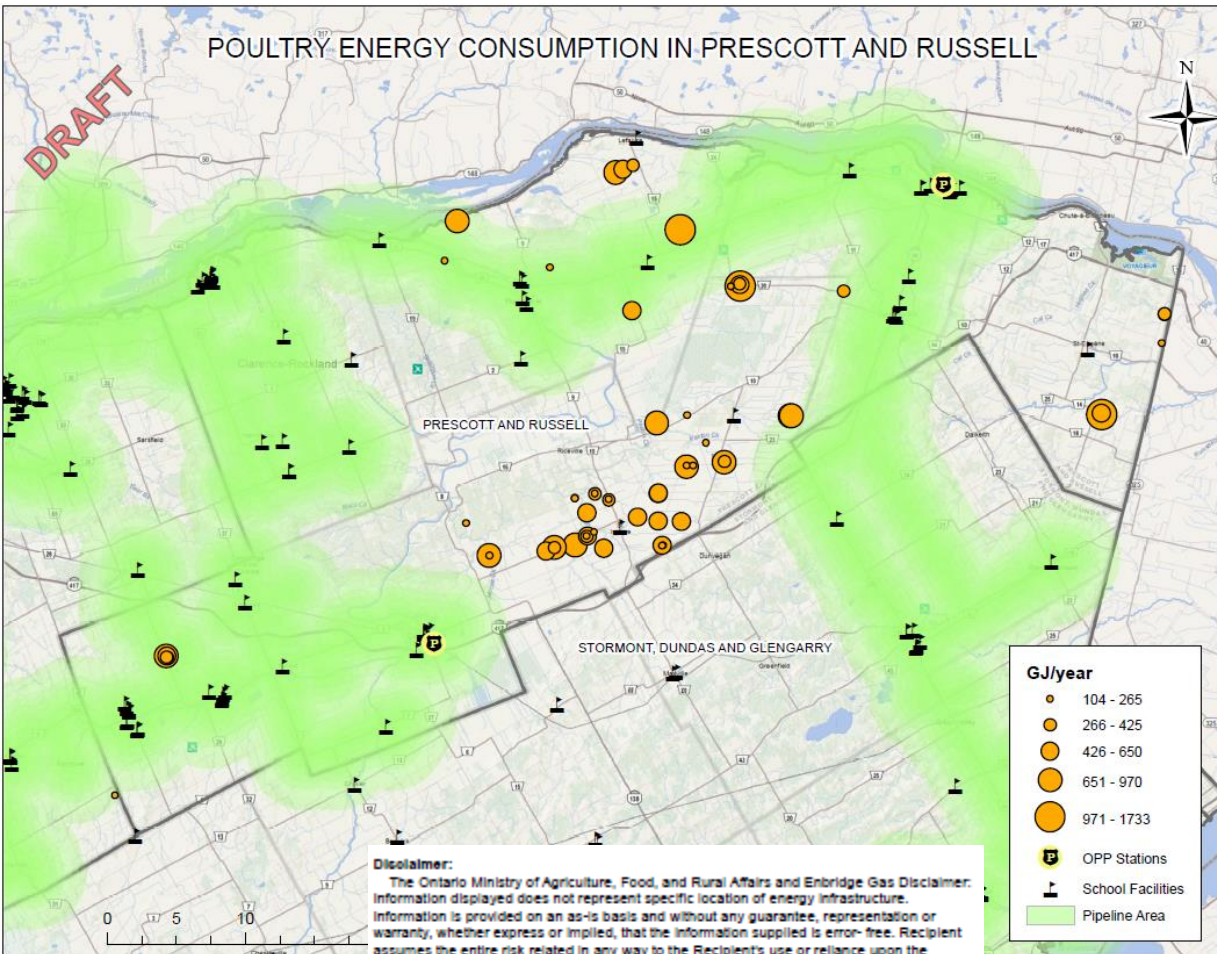
Estimated heating metrics for agricultural operations and applicable MUSH buildings are shown in Table 1.

Sector	BTU/ft ²	GJ/m ²
Broiler Chicken	50,000	0.57
Turkey Barns	34,000	0.385
Greenhouse	218,000	2.50
Sow farrow to wean or nursery	25,000	0.284
Dairy Milking hot water	9,500	0.11
Grain Drying	582,000 btu /tonne	0.613 GJ/tonne
Community Centre	79,190	0.90
Fire Hall	77,720	0.88
Arena	45,910	0.52
Library	59,517	0.68
School	65,170	0.74

Table 1. Heating Metrics per year

Note: Energy needs for each agricultural application and MUSH building are presented in British Thermal Units (BTUs) and Giga-joules (GJ).

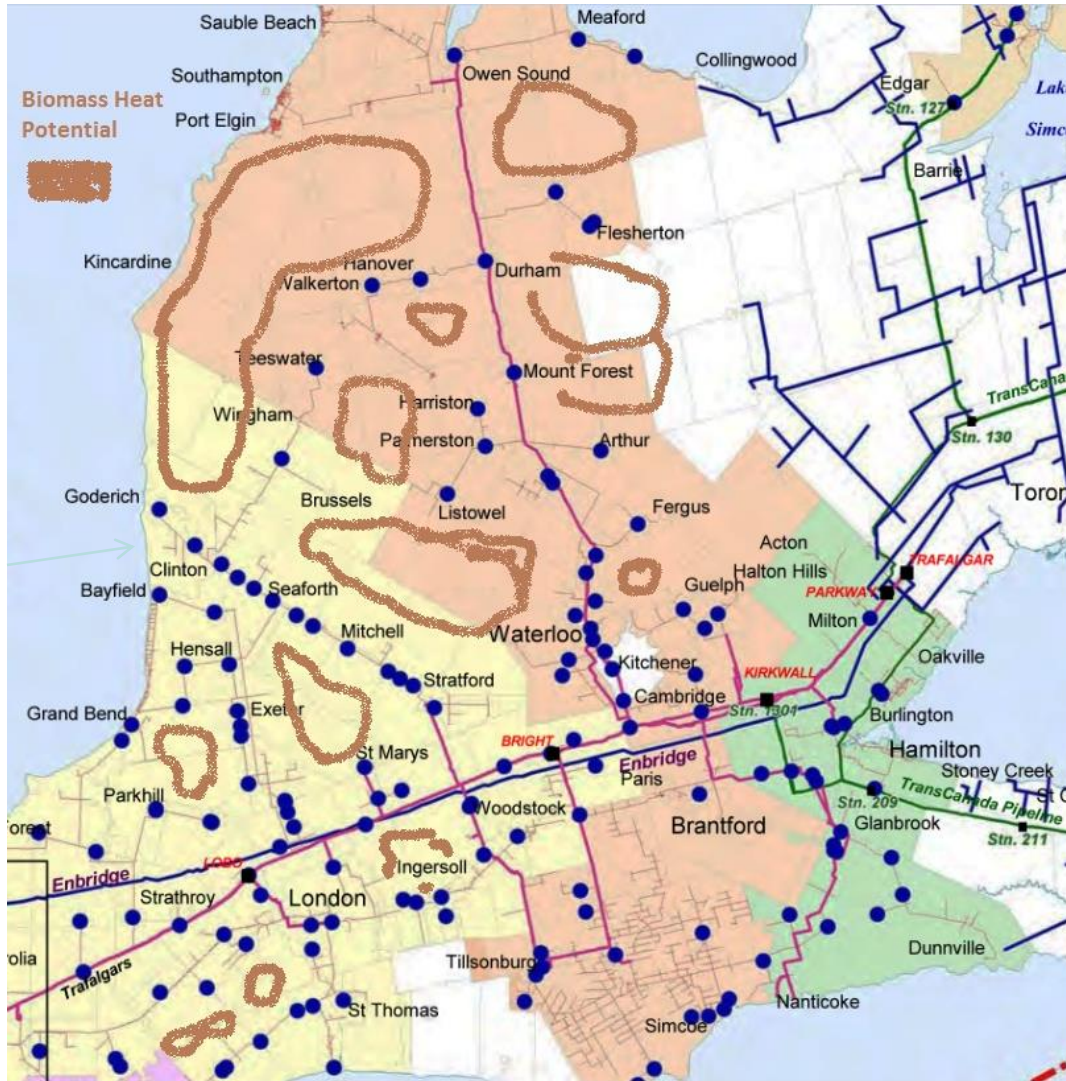
Identifying biomass thermal opportunities



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- Who should burn biomass to save \$ and reduce GHGs?
- Green area on map = close to pipeline, should consider cheap natural gas
- Not in green? Likely could economically convert to biomass heat (likely wood biomass combustion).

Possible Biomass Heat Zones



Source of base map http://uniongas-airmissionplan.ca/pdfs/UGL_coverage_map%20with%20stn%20heat%20apr%202008.pdf

On-Farm Biomass Storage Options

Covered Storage



Photos : Jon Montan & OMAFRA

\$\$ Cover or not cover ?? \$\$  Ontario

Identifying Renewable Natural Gas (RNG) Opportunities

- Where can we put low GHG RNG back into the pipeline?
- RNG: biogas cleaned from 60% methane to 95%+ (pipeline quality)
- Project Identify livestock clusters big enough to build economical RNG projects using GIS and economics calculations
- Programming skills to run algorithm are outside level of normal GIS training



Draft Natural Gas pipeline area in Eastern Ontario 300 m wide buffer area

