



FEASIBILITY STUDY FOR ANAEROBIC DIGESTION OF AGRICULTURAL AND ORGANIC WASTE IN SARNIA-LAMBTON

GROWING THE MARGINS

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AGENDA

- Background
- Lambton County Overview
- Data Acquisition and Assumptions
- Scenario Development & Locations
- Financial Factors
- Analysis of Outcome
- Presentation of Results & Follow-Up
- Steps Taken & On the Horizon





BACKGROUND

- Conducted a Preliminary Study to investigate the feasibility of the development of one or more AD facilities in Sarnia-Lambton
- In partnership with SOBIN, SLEP, Bluewater Power, and MJ Waste Solutions
- Study provides high level evaluation of economic feasibility with a review of the technical, and social impacts regarding their implementation





BACKGROUND

- Inventory of waste streams by township (manure, household organics, off-farm processing waste, as well as large producers)
- Identification of natural gas pipelines and three-phase electrical lines
- Identification of large heat and power users
- Determination of preliminary locations and size of a facility
- Sensitivity analysis and ranking of locations





LAMBTON COUNTY OVERVIEW

- Population of 128,000
- 2,400 farms
- Available Organics
 - 35,000 tonnes of MSW (Recoverable ~11,000 tonnes)
 - 1,000 tonnes of Grocery Store Waste (\$80/tonne)
 - 13,500 tonnes of Food Processing Waste (\$22/tonne) – Caustic
 - WWTP, Abattoirs
- Large Heat and Power Users are not close to Farms





DATA ACQUISITION & ASSUMPTIONS

- OMAFRA – Farms >300 NUs
- Union Gas
- Hydro One and Bluewater Power
- Sand Bedding was not used at the dairies
- Swine and Poultry were hauled one-way due to bio-security issues
- Majority of Swine Operations use under-barn collection systems





DATA ACQUISITION & ASSUMPTIONS

- Manure properties (moisture content, density)
- Organic waste properties (moisture content, density)
- Biogas generation parameters (TS, VS/TS, methane yield, biodegradability, methane content)
- Transportation unit costs (fixed costs for load/unload, variable costs for hauling)
- Capital cost factors (scale factors, operating life)
- Operating cost factors (staffing, O&M)
- Revenue factors (sale of gas, carbon credits, tipping fees)





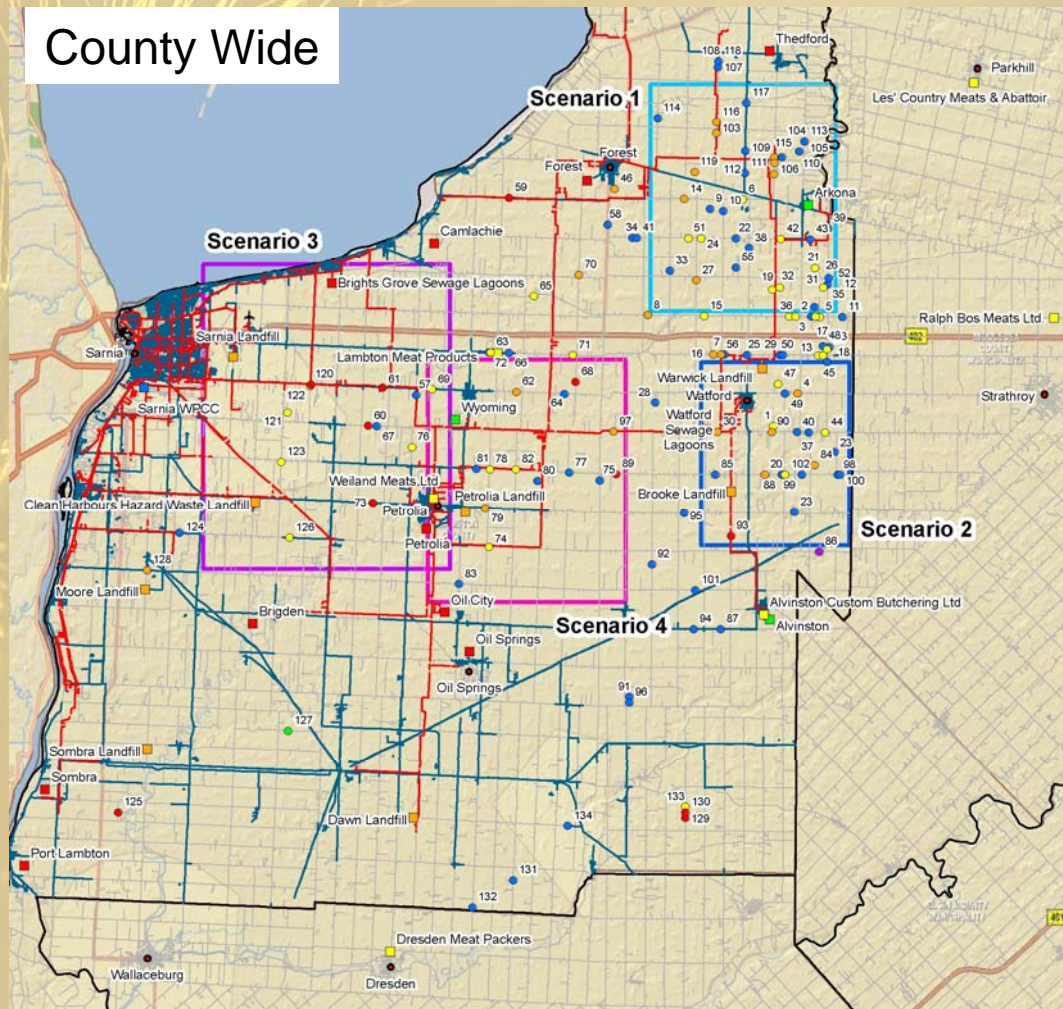
SCENARIO DEVELOPMENT

- Based on available agricultural feedstock (manure) and suitability of the plant to power lines or pipelines
- Large co-operative AD systems
- Zoomed-In Scenarios to allow for less environmental permitting
- Each Scenario was reviewed with and without off-farm organics
- Transportation was limited to 5 km except poultry which was limited to 12 km due to higher solids content





SCENARIO LOCATIONS



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FINANCIAL FACTORS

- All scenarios were modeled on current Ontario market
 - Used blended rate for electricity sales \$0.119/kWh
 - \$5/MMBtu
- Utilization of heat from co-generation units was not accounted as a revenue stream
 - Only one scenario had identified user





ANALYSIS OF OUTCOME

- After modeling, sensitivity analysis was conducted for several parameters
 - Lower capital cost recovery factor
 - Increase in SOP
 - Transportation optimization
 - Increase in tipping fees
 - Incentives/ grants
- Sensitivity parameters made the difference
 - Some projects became viable
 - Lower CCRF was most effective





PRESENTATION OF RESULTS

- Presentation of results conducted for SOBIN, SLEP, Bluewater Power and potentially interested producers who were part of the overall study
- Expressed that follow-up meetings and further work is required
 - Nature of study is preliminary and high level





FOLLOW-UP

- Following presentation of results, meetings were held to identify further interest;
- Several farms expressed interest in development;
- Some identified as not feasible for various reasons
 - Hog farms due to manure management concerns
 - Dairies due to other factors
- However, some operators identified that they would like to continue with investigations





STEPS TAKEN

- Complete & submit OMAFRA feasibility study funding application
- Receive approval for funding
- Initiate feasibility study
- Currently, two separate feasibility studies are underway





ON THE HORIZON

- Complete on-farm analysis including:
 - Specific manure production
 - Specific biogas yield
 - Management changes
- Lock in off-farm organics
 - Many competing for finite amount
- Ministry approval
 - May still require C of A for use of off-farm





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QUESTIONS/COMMENTS



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WTF



THANK YOU



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