



12TH CANADIAN POLLUTION PREVENTION ROUNDTABLE

June 10-12, 2008
Edmonton, Alberta

Crowne Plaza- Chateau Lacombe

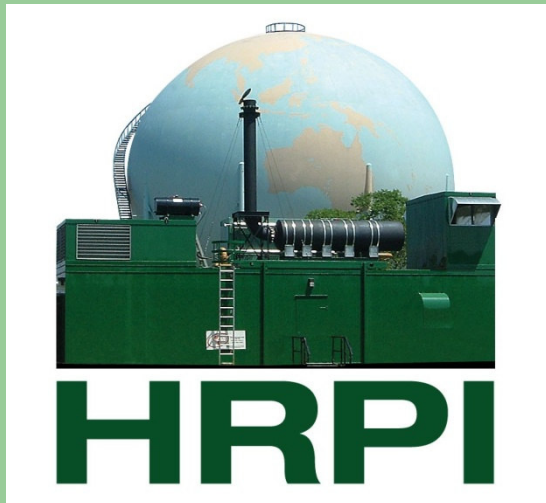




11.2 “Leadership in Creating Innovative, Sustainable Energy”

Jim Harnum, Senior Director of Water and
Wastewater, Public Works Department, City of
Hamilton, Hamilton Renewable Power Inc.
(2008 P2 Award Winner – GHG Reduction)

Creating Innovative Sustainable Energy



Presentation to Canadian
Pollution Prevention
Roundtable June 12th, 2008



The Need

- 10 MW of new back-up power at WWTP
 - Disposal of 6 million cubic meters of biogas per year with a 65% methane content
 - \$800K of natural gas required annually to heat digesters
 - The Province of Ontario needs 2000 MW of renewable energy to offset Nanticoke coal plant
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Project Development

- Water and Wastewater staff had been studying the overall Electrical and Thermal needs of the Treatment Facilities at Woodward
 - Final Report received recommending a 3 year, \$50 million upgrade to the Electrical and Thermal assets
 - All Electrical and Thermal assets to be housed in a single Energy Plant of 8 to 12 MW
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Background

- Corporation created in December 2004 to respond to the Ministry of Energy RFP for Renewable Energy
 - Initial Project was a 1.6 MW generator at the Woodward WWTP at a cost of \$4.4 M
 - Renewable Energy Supply (RES) signed with the Ontario Electricity Financial Corp. (OEFC) Dec 2004 to supply Green Energy for a 20 year term
 - Officers and Board Members assigned in Dec 2004
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Corporate Governance

- Officers of the Corporation:
 - Joe Rinaldo – President
 - Jim Harnum – Vice-President
 - Kevin Christenson – Recording Secretary
 - Board Members:
 - Dave Mitchell – Chairman of the Board
 - Mayor Fred Eisenberger – Voting Board Member
 - Lloyd Ferguson – Voting Board Member
 - Brad Clark – Voting Board Member
 - Scott Duval – Voting Board Member
 - Scott Stewart – Non-Voting Board Member
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Shareholder's Agreement

- To address:
 - Permitted business activities;
 - Standards of governance;
 - Board of Directors (number of, composition, etc.);
 - Financial policies, risk management, financial plan;
 - Meetings and annual resolutions;
 - Reporting on major developments; and
 - Matters requiring shareholder approval
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Goals of the Project

- Producing green renewable energy from a waste source
 - Reducing greenhouse gas emissions
 - Increasing energy efficiency at the WWTP
 - Generating revenue and reducing operating costs by generating electricity and utilizing waste heat
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DB-O&M

- Hired Toromont and CRA as to Design and Build
 - Co-gen facility will require O&M
 - Recommended that Toromont Operate for the first year or so until they have worked out all the bugs
 - Then recommending to utilize WWW staff to manage and operate and contract the engine supplier for large scale maintenance
 - Signed a 5 year Maintenance contract with Toromont based on available run time on the engine
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Contracts and Agreements

- Enter into a Loan Agreement with the City of Hamilton to secure the necessary funds to proceed with the project
 - Enter into a Service Level Agreement with the City of Hamilton for the supply of personnel and services to project manage and operate and maintain the Co-gen facility
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Contracts and Agreements

- Enter into a Royalty Agreement with the City of Hamilton for the supply of Bio-gas to the Co-gen facility
 - Enter into a Lease Agreement with the City of Hamilton to secure the necessary lands to build the Co-gen facility on
 - Move forward with the necessary approvals from the IESO and the LDC
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Woodward Digester Gas Project

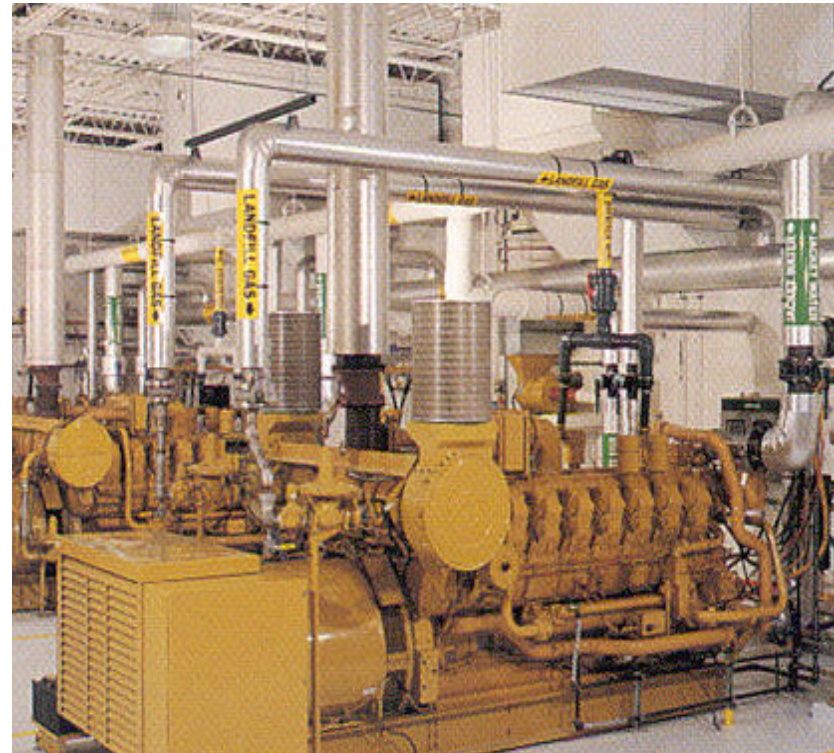
- 1.6 MW generator cost \$4.4M, uses methane gas from the WWTP digesters to generate Electricity
- Electricity sold to the province at a premium, 20 yr contract
- Heat is harvested from the engine and used to heat facilities off setting over \$400K in natural gas costs





Woodward Digester Gas Project

- City of Hamilton was the Only Municipality to be accepted by the OEFC to build a generator
- Project was commissioned in June 2006
- Project was commissioned ahead of schedule and just under budget
- Ribbon Cutting and Official Opening Ceremonies took place in the September 2006





Woodward Digester Gas Project

- A 5 yr maintenance contract and a 1 yr operating contract with 4 option years has been negotiated with Toromont.
- Finalize Service Level Agreements between the City and HRPI for the cost of staff time
- Engine has been operating at about 93% efficiency (close to design) since commissioning





Summary of HRPI Funding

Current Funding

Approved Capital Loan **\$4.4 million**

Proposed Funding

Loans

Amended Capital Loan	\$2.2 million	
Short-term Operating Loan	<u>\$2.5 million</u>	\$4.7 million

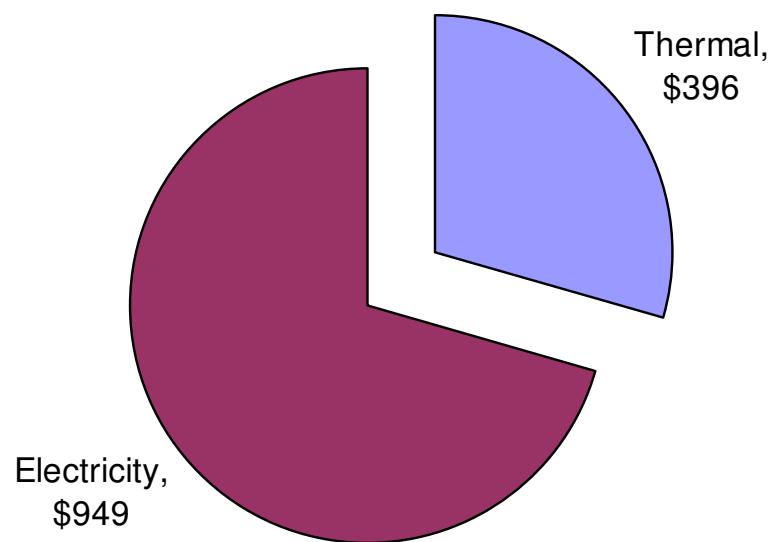
Shareholder's Equity Investment \$2.2 million

Total Proposed Funding **\$6.9 million**



2007 Revenues

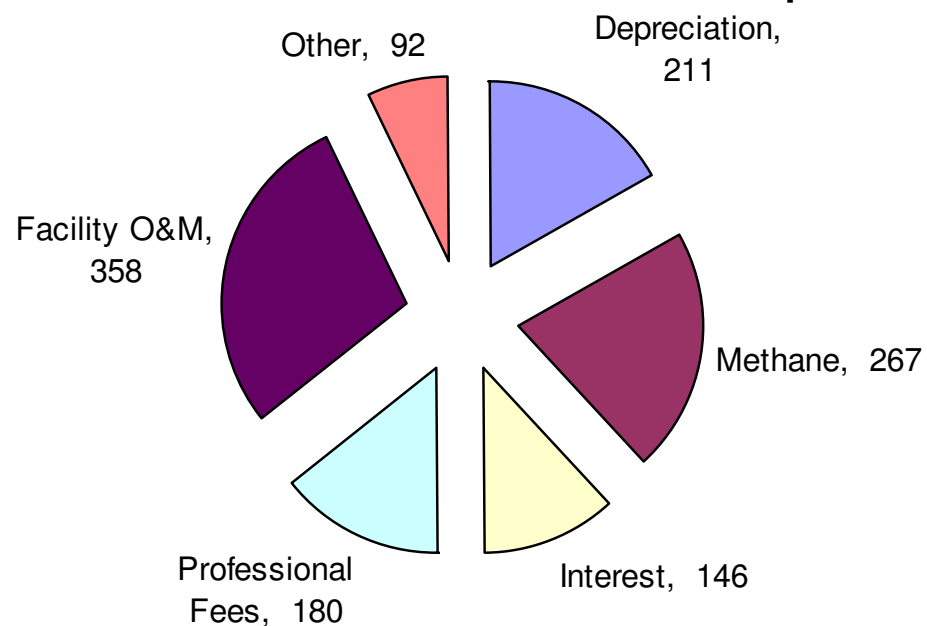
**Hamilton Renewable Power Inc.
2007 Revenues (thousands\$)**





2007 Expenses

Hamilton Renewable Power Inc. 2007 Expenses



Other includes: Bank Charges, Capital Tax, Insurance, Communication charges and Miscellaneous charges. Methane is considered a cost of goods sold and netted with revenues, rather than expensed.



2007 Financial Statements



Methane (\$267K)



Thermal \$396K



Elec. Sales \$949K

Electricity

OPA

2007 Profit & Loss



For the year ended December 31, 2007

REVENUES

Electricity Revenue	949,129
Thermal Revenue	395,774
Other Revenue	<u>94,296</u>
TOTAL REVENUES	1,439,199

EXPENSES

Methane	267,385
Bank & Interest Charges	2,133
Capital Tax	15,001
Communications Charges	25,289
Depreciation	211,035
Miscellaneous	3,162
Interest on Long-term Debt	146,208
Professional Fees	180,299
Repairs & Maintenance	<u>357,710</u>
TOTAL EXPENSES	1,254,898

NET INCOME

184,301

2007 Balance Sheet



As at December 31, 2007

ASSETS

Current Assets	
Cash & Cash Equivalents	1,082,701
Other Current Assets	<u>5,690</u>
Total Current Assets	1,088,391
Fixed Assets	8,926,097
Other Assets	<u>32,000</u>
TOTAL ASSETS	10,046,488

LIABILITIES & EQUITY

Current Liabilities	
Accounts Payable	1,264,804
Other Current Liabilities	<u>1,152,362</u>
Total Current Liabilities	2,234,681
Long-term Liabilities	<u>1,939,316</u>
Total Liabilities	4,356,482
Equity	5,690,006
TOTAL LIABILITIES & EQUITY	10,046,488



2007 Financial Results

- 2007 Audited Financial Statements Complete
 - Assets of \$10.0 million
 - 2007 Operating Revenues of \$1.34 million
 - Direct Benefits to the City of Hamilton of \$949.6K
 - Purchase of methane from City \$267,400
 - Purchase of professional services from City \$102,120
 - Natural Gas purchase avoided by City \$395,780
 - HRP Inc. 2007 Net Income \$184,300
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Vital Statistics

2007 Electricity Sales

Total – 12,635 MWh

Min monthly – 859 MWh

Average monthly – 1,053MWh

Max monthly – 1,177MWh

2006 Contract price \$74.99/MWh

2007 Contract price \$75.08/MWh

2008 Contract price \$75.28/MWh



The Benefits

- Production of 1.6 MW of renewable energy that will displace energy that is produced from coal
 - The reduction of over 1.5 million m³ of natural gas annually
 - Reduction of over 60,000 tonnes of due to the reduced energy demand at the plant
 - Reduction of 6,500 tonnes of carbon dioxide emissions annually
 - Local production of energy makes Hamilton more self-sustainable for the future
 - Employment opportunities for operation and maintenance staff in Hamilton
 - A model for other municipalities to utilize in the quest for new innovative solutions
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Glanbrook Landfill Gas Project

- Early 2005 methane detected in leachate collection system
 - April 2006 Budget approved for the collection and flaring of landfill gas with possible energy production
 - In 2005 the Ministry of Energy released a draft RFP for green energy production under 20 MW called “Renewables III”
 - Renewables III never finalized and instead Ministry of Energy releases draft document called “Standard Offer Program” for any project under 10 MW
 - Rates recommended to be set at 11.5 cents per KWh
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Glanbrook Business Case

Forecasted average annual:

- Electricity sales \$2.9M
 - Operating costs \$0.530M
 - Earning before taxes \$1.5M
 - Net Income \$0.960M
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- Capital depreciation would be accelerated
 - Losses carried forward
 - Loan repayment \$3.8M principal and \$1.55M interest
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Existing Capital Structure

- 50% Debt and 50 Equity – similar to Local Electricity Distribution Corporations

Current Funding

Capital loan	\$2.2 million
Short-term operating loan	<u>\$2.5 million</u>
Total Loans	\$4.7 million
Shareholder's Equity	\$2.2 million
Total City Funding	<u>\$6.9 million</u>

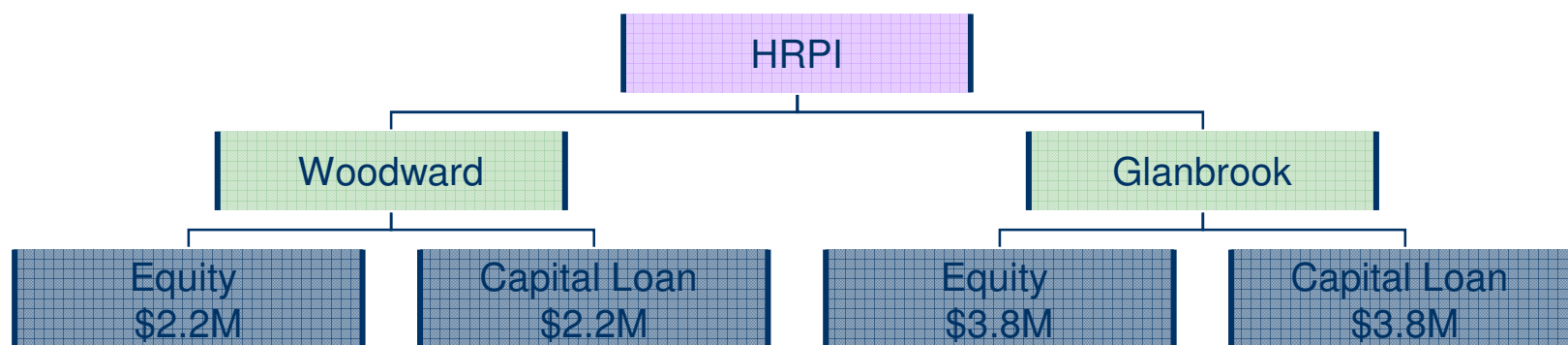


Proposed Funding

Amended capital loan	\$6.0 million
Short-term operating loan	\$2.5 million
Total Loans	<u>\$8.5 million</u>
Shareholder's Equity	\$6.0 million
Total City Funding	<u>\$14.5 million</u>
Increase in funding	\$7.6million



HRPI Capital Structure





Glanbrook Landfill Gas Project

- KPMG hired to determine potential payback of energy project based on estimated Capital / Operating costs
- Project break even @ 6 cents and profitable at 8 cents (avg. price to date) and very attractive at 11.5 cents
- Two companies known for large scale landfill gas to energy projects invited to bid on Design/Build/Operate/Maintain RFP for potential partnership
- Companies were GE Jenbacher and Toromont CAT





Glanbrook Landfill Gas Project

- Bids were received from both proponents which were subsequently assessed for equal comparison
 - Capital cost for:
 - Toromont CAT = \$8.2M
 - JE Jenbacher = \$9.2M
 - 20 year NPV Operating Cost for:
 - Toromont CAT = \$6.7M
 - JE Jenbacher = \$7.4M
 - Toromont clear winner, Board approved the selection of Toromont as successful proponent on May 15th, 2006
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Glanbrook Approvals

- Ministry of the Environment - Two Certificates of Approval (Air and Site)
- City of Hamilton - Building permit
- Hydro One - Impact Connection Assessment
- Ontario Power generation - Standard Offer Program
- Hydro One – Connection Cost Estimate





Glanbrook Landfill Gas to Energy

Gas Collection System Overview

- 28 horizontal collectors that span the site
 - 15 vertical collectors on finished side slopes
 - 3 condensate traps that drain to leachate collector
 - Perimeter header that conveys methane to engines
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Glanbrook Landfill Gas to Energy

Energy System Overview

- 2 combustion engines generating 3.2 MW of Energy
 - Generate enough electricity to power 2100 homes
 - Engines supplied by Toromont-CAT
 - Run on methane gas
 - Sell power to Hydro One
 - Remove 100,000 tonnes of CO₂ emissions/year
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Glanbrook Landfill Gas to Energy

Status of Energy

Generation Installation

- Both engines installed
- Flare installed
- Buildings completed
- Blowers and ancillary equipment completed





Glanbrook Landfill Gas to Energy

Status of Gas Collection System Installation

- Horizontal collectors installed
- Vertical wells completed
- Perimeter header installed
- Condensate traps completed





Glanbrook Landfill Gas to Energy

- Site construction completed Dec. 2007
- Delays from Hydro One technical review
- Estimated engine go live date Sept. 15, 2008
- Estimated sale of energy to the grid Oct. 15, 2008





Questions?
