

Agenda

- Introduction to :
NRGreen Power, and
Alliance Pipeline Canada
- Technology
Waste Heat to Power– advantages & process
Organic Rankine Cycle
- Development Opportunities and Challenges
Waste Heat to Power Opportunities

Overview – NRGreen Power

- NRGreen Power is an Alliance Canada related party first established in 2002
- Commercial development of waste heat electrical generation opportunities at Alliance Pipeline compressor stations

**Strong and Stable
Ownership**
50% Enbridge
50% Veresen



HEAT IS POWER
LET'S CAPTURE IT

NRGreen
POWER



Waste Heat to Power Generation Process:

Innovative technology consists of two processes

- The 1st process loop captures waste heat from hot turbine exhaust using a heat exchanger that contains circulating thermal oil and a waste heat recovery unit
- The 2nd process loop is the energy converter system that transfers the heat from the thermal oil to a circulating organic working fluid through a series of heat exchangers using the Organic Rankine Cycle process





New Facilities: Alberta Initiatives





Waste Heat to Power U.S. Opportunities:

Proposed Projects at Alliance Compressor Stations:

Seven sites capable of 6 MW

These projects will provide the following benefits:

- Can generate **700,000 MWh per year**
 - Enough to power ~182,000 homes
- No new GHG emissions and does not use water
 - Offset @385,000 tonnes of GHG Emissions per year
- Estimated ~ \$300 million of capital investment



Advancing Waste Heat to Power:

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Closing remarks:

- NRGreen Power has a solid, safe and efficient history operating WHP facilities
- Advantages of NRGreen Power's Projects include:
 - Electricity generation that produces no new greenhouse gas emissions
 - Reliable source of base-load power from existing pipeline compressors
 - Technology can be applied to other industrial heat sources
- Project Economics require Public Policy Support on a State / Federal level to facilitate future development of Waste Heat to Power Projects in the U.S.



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