Gas Pipeline Efficiency Session:
Ormat’s Recent Successful Waste Heat Recovery Applications

Gas / Electric Partnership Conference
Houston, February 9, 2011
Colin Duncan – Ormat Technologies, Inc.
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The information contained in this presentation should be read together with all other and previous publications and releases of Ormat.

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Agenda

- Company Overview
- History and Capabilities
- Activity Segments
- Technology
- Track-Record
- Project Development
- Benefits
A leader in geothermal and recovered energy generation

- Focus on Geothermal and Recovered Energy since 1984
- Listed on the New York Stock Exchange (ORA)
  - The only pure-play geothermal/REG company listed (NYSE)
- Owns and operates ~538 MW* generation world wide
- Supplied ~1,300 MW of geothermal and recovered energy power plants in 24 countries
- Recovered Energy Generation Sector
  - Developed over 130MW of REG power plants in North America
  - ~ 96% of all REG supplied through April 2009 by Ormat are located in North America
- Geothermal Sector
  - Ormat makes up ~ 70% of geothermal capacity installed in the U.S. since 2000

*Capacity under ownership as of Dec. 2010. Including the 50 MW of North Brawley in California, which operates at approx. 30 MW according to the Company discloser from Feb 1, 2011 **Market Cap. as of Feb, 4 2011
From Massachusetts to Nevada

- 1972-1984: Ormat in Massachusetts
- 1984-Present: Ormat in Nevada

Ormat plant in Hopkinton, Massachusetts where 120 OEC for Alyeska were manufactured

Ormat Technologies headquarters in Reno, Nevada
Capabilities: Manufacturing and Quality Assurance

Heat Exchangers Workshop

CNC Machining

Organic Vapor Turbine Assembly

CNC Measurement
Ormat Technologies, Inc. (NYSE: “ORA”)

- Flexible Business Model
  - Supply of Equipment
  - Engineering, Procurement and Construction (EPC)
  - IPP: Develop, Build, Own, Operate (BOO)
Waste Heat Recovery Opportunities

- Wide Array of Applications
  - Gas Compressors Stations
  - Gas Processing and Fractionation Plants
  - Open Cycle Gas Fired Power Stations
  - Industrial Processes
    - Cement production facilities
    - Air production/processing
    - Biomass
    - Refineries
    - Pulp and paper mills
    - Glass manufacturing
    - Steel mills
    - Other industrial exhaust waste heat
Different Applications of Waste Heat Recovery

Example of installation at a gas compression station

- OEC
- Gas Turbines
- Original Stack
- Waste Heat Oil Heater
- Diverter
- Compressor Building

Different Applications of Waste Heat Recovery:
- Cement Plant
- Oil Refinery
- Gas Engine

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Different Applications of Waste Heat Recovery

OEC system for the cement industry
Technology Benefits

Compatibility with temperature fluctuations

- Generator Output
- Cooler Air Temperature
- Thermal Oil Temperature

OEC Generator Output [kW]

Temperature [°C]
### Waste Heat Recovery Output for GT’s

<table>
<thead>
<tr>
<th>Turbine Manufacturer</th>
<th>Model</th>
<th>Turbine MW (*)</th>
<th>WHR Output MW (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolls Royce</td>
<td>RB 211</td>
<td>25</td>
<td>6.5</td>
</tr>
<tr>
<td>GE</td>
<td>LM 2500</td>
<td>23</td>
<td>6.2</td>
</tr>
<tr>
<td>Solar</td>
<td>Titan 130</td>
<td>15</td>
<td>3.4</td>
</tr>
<tr>
<td>Solar</td>
<td>Mars 100</td>
<td>11</td>
<td>2.2</td>
</tr>
<tr>
<td>Solar</td>
<td>Taurus</td>
<td>9</td>
<td>1.8</td>
</tr>
</tbody>
</table>

(*) Gross at ISO conditions
Ormat Technology Benefits

- High aerodynamic turbine efficiency: 88% to 91%
- Moisture-free turbine expansion
- Fast on-site installation and implementation
- Reliable, unattended operation
- Low operation and maintenance costs
- Rugged design for severe climates
- Field-proven technology
- Environmentally friendly
- Versatile application (heat source temperature, power output)
- Handles fluctuating loads
- Black-start and island-mode capability
Same Technology – Two Applications

20 MW Amatitlan, Geothermal Power Plant, Guatemala

5.8 MW Recovered Energy Generation Power Plant at the Alliance Pipeline Kerrobert Compressor Station, Saskatchewan, Canada
Track Record: Geothermal

>1200MW of power plant capacity

57 MW Ormesa Geothermal Power Complex, California

30 MW Puna Geothermal Combined Cycle Power Plant, Hawaii

132 MW Upper Mahiao Geothermal Combined Cycle Power Plant, Philippines

92 MW Heber Geothermal Power Complex, California

85 MW Steamboat Geothermal Power Complex, Nevada

110 MW Mokai Geothermal Combined Cycle Power Plant, New Zealand
Track Record: Waste Heat, REG®

> 130 MW gross of power plant capacity

6 MW Kerrobert, Waste Heat, REG® Power Plant, SK, Canada

7 MW CS12, Waste Heat, REG® Power Plant, MN, USA

22 MW Long Lake, Waste Heat, REG® Power Plant, AB Canada

5 MW OREG 4, Waste Heat REG® Power Plant, CO, USA
US Natural Gas Compression Plants

Gas-fired Gas Turbines Only

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Ormat’s Successful REG Projects in North America

Successful waste heat recovery projects – North America only

<table>
<thead>
<tr>
<th>Projects</th>
<th>Capacity</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Border Pipeline</td>
<td>10</td>
<td>65MW</td>
</tr>
<tr>
<td>Alliance Pipeline</td>
<td>4</td>
<td>21MW</td>
</tr>
<tr>
<td>Kinder Morgan gas pipelines</td>
<td>1</td>
<td>4MW</td>
</tr>
<tr>
<td>Neptune gas processing plant</td>
<td>1</td>
<td>4MW</td>
</tr>
<tr>
<td>Kern River Gas Transmission Pipeline</td>
<td>1</td>
<td>7MW</td>
</tr>
<tr>
<td>Spectra gas pipeline</td>
<td>2</td>
<td>10MW</td>
</tr>
<tr>
<td>OPTI-Nexen gas refining facility</td>
<td>1</td>
<td>22MW</td>
</tr>
<tr>
<td>TransCanada Gas Pipeline</td>
<td>1</td>
<td>6.5MW</td>
</tr>
</tbody>
</table>

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Ormat’s Experience: First ORC on a Pipeline

Alberta - Canada

- First ORC commercial heat recovery project on a pipeline compressor station in the world – 1999
- Heat source – RR RB211 GT
- Owned and operated by Maxim Power and TransCanada Pipeline
- Capacity: 5.8 MW net
- Electricity sold to Alberta Power Pool
- Designed to operate below -22°F
Ormat’s Experience: Neptune Gas Processing Plant

Louisiana - USA

- Heat source - 2 Solar Mars 100 Gas Turbines
- REG application - 4.6 MW
- Allows island-mode operation
- Historical availability factor near 100%
- O&M performed by the plant operating team
- 24/7 monitoring using Ormat’s remote monitoring software package
Recent Success Story: OREG 3 Compressor Station CS13

Minneapolis
- Heat source – 1 Rolls Royce RB211 (39,600 hp)
- CS 13 OREG-3 REG owned and operated by Ormat
- Commissioned in August 2010
- Capacity: 5.5 MW net, 6.3 MW gross
- Electricity and REC’s are sold to Great River Energy
- Operating conditions below -31°C
Recent Success Story: OREG 4 – Peetz Project

Colorado

- Heat source - 2 Solar Mars 100 GTs (15,000 hp ea)
- OREG-4 Peetz REG is owned and operated by Ormat
- Commissioned in March 2009
- Capacity: 3.5 MW (net)
- Electricity and REC’s are sold to Highline Electric Association
- Operating conditions below -22°F
Recent Success Story: Goodsprings Project

Nevada

- Heat source – 3 Solar Mars 100 GTs (15,000 hp ea)
- Goodsprings REG is owned by NV Energy including all REC’s
- Plant operated by Ormat for 3 years
- Commissioned in October 2010
- Capacity: 6 MW net, 7.5MW gross
- Built on the Kern River Gas Transmission pipeline
Important factors in developing viable projects:

- Heat source run times
- Historic and future operations for heat supply
- Heat source unit age, reliability, condition
- Electricity market prices
- Host and site fees
- O&M costs
- Escalating project costs
- Utility grid interconnection costs
- Designing to site specific conditions
- Limited impact to host operations during tie in
Waste Heat Recovery Benefits

- WHR provides offsets for GHG emissions, carbon offsets, green tags, RECs and other products where qualified
- Qualification of WHR is as eligible technology in various states for mandated RPS’s
- Utilizes indigenous energy resources
- Can provide additional operational flexibility
- Compliance with emission requirements
- PR benefits in developing environmentally conscious projects
- Create more efficient industrial facilities
Environmental Benefits

- Each MWh derived from recovered energy generation will save approximately*:
  - 1.0 ton of CO₂
  - 1.25 kg of NOₓ
  - 4.5 kg of SO₂

- At designed capacity, a 6 MW REG® plant will save:
  - ~ 48,000 tons of CO₂ per year
  - ~ 66 tons of NOₓ per year
  - ~ 240 tons of SO₂ per year

* Offsetting energy generated by coal-fired power plants.

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Time... The Only True Test of Reliability
Thank You!

For questions regarding this presentation, please contact

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