

**1/24/11  
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TION:  
MOUNT  
SPURR  
GEOTHERMAL  
PROJECT**

<TARGET><BILL></BILL><SUBJECT>1-24-11 PRESENTATION  
MOUNT SPURR GEOTHERMAL  
PROJECT</SUBJECT><COMM>HRES27</COMM></TARGET>

# The Mount Spurr Geothermal Project

## Presentation to House and Senate Resource Committees

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1

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## Outline

0. Introduction to Ormat; Geothermal Power; Mt. Spurr project
  1. Project timeline
  2. Transmission needs
  3. Amount of power supplied to Railbelt
  4. Likelihood of completion
  5. Permitting roadblocks
  6. Community support
  7. Sources of project financing
  8. Cost of power to utilities
  9. Legislative needs



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## Ormat Brings Credibility

- A leader in geothermal power
- Owns and operates 538\* MW worldwide
- Supplied approximately 1,300 MW to 24 countries
- Vertically integrated:
  - Explores, develops, engineers, manufactures, constructs, operates
- Employs 470 people in the U.S. ; >1,000 worldwide;

**NYSE:** "ORA"

**Market Cap. :** \$1.39B\*\*

**LTM Revenues:** ~\$375M



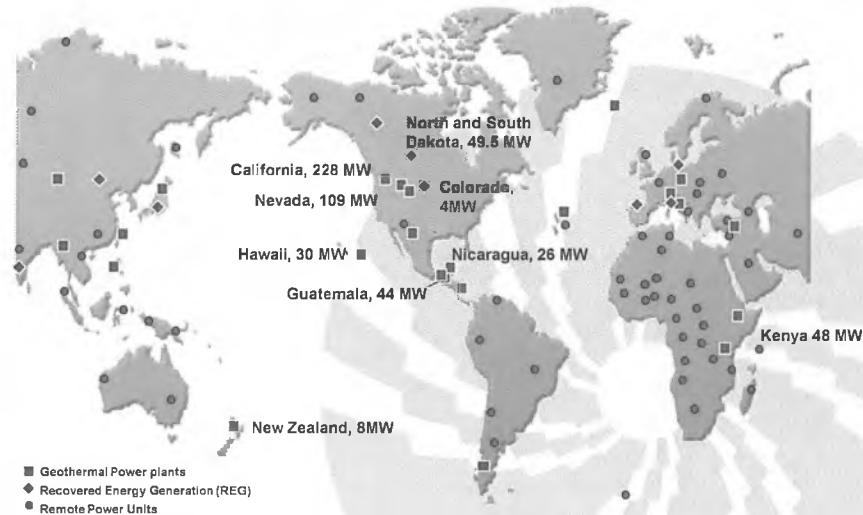
\*As of December, 2010, including the 50 MW of North Brawley in California which operated at approx. 25 MW

\*\*As of January 21, 2011

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## Global Presence\*; 71 Countries



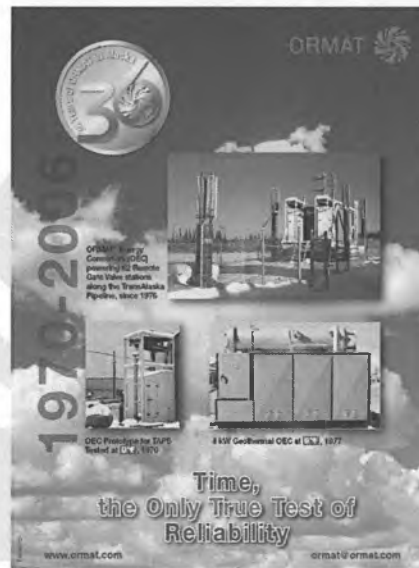
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## Ormat's Commitment to Alaska

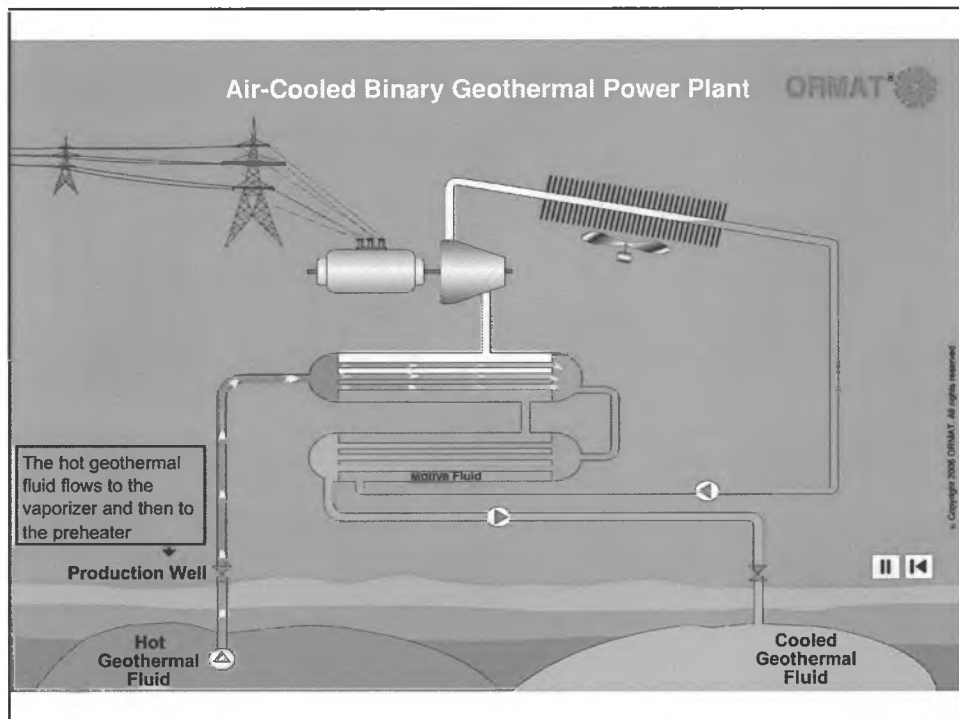
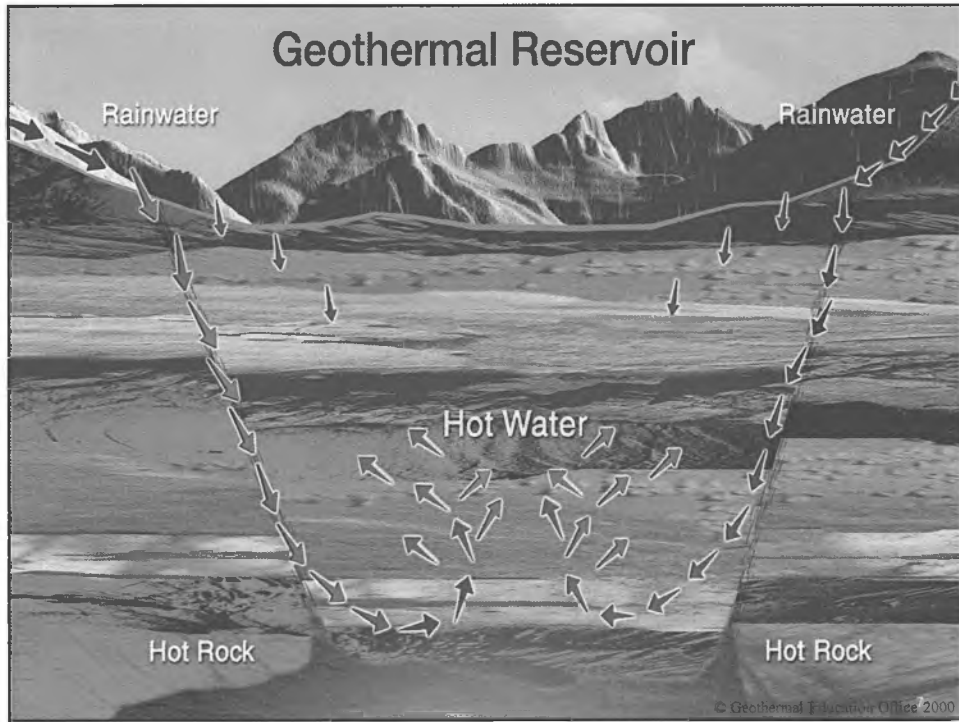
- >100 Remote Power Units
  - Serving remote gate valves
  - TransAlaska Pipeline
  - Since 1975
- First geothermal unit
  - Tested in 1979
  - University of Alaska Fairbanks
  - At Manley hot springs
- Approx. \$5 million of Ormat equity invested in Mt. Spurr to date



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## Geothermal – Key Attributes

- Utilities' renewable energy of choice:
  - Base-load generation
  - Cost-competitive
  - Highly reliable; >>95% availability
  - Proven technology: ~10,000 MW deployed worldwide
- No fuel cost risk; Fixed long-term pricing
- Sustainable & environmentally friendly
  - Closed loop system with near zero emissions
  - No water consumption [Mt. Spurr plant will be air-cooled]
  - Minimal surface and visual impact
- Creates long-term, high-quality jobs

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## Geothermal – Development Inhibitors

- Resources are scarce
- High upfront CAPEX and risk required in order to discover and confirm the resource

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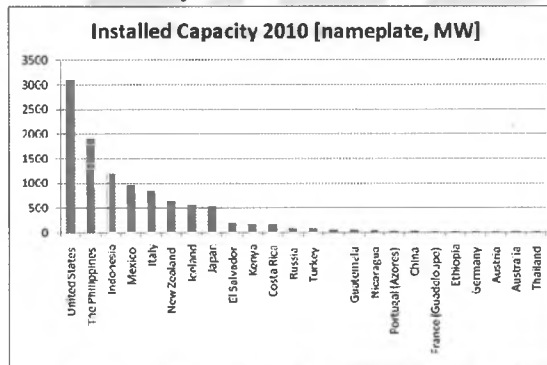
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## Worldwide Deployment

- Approximately 11,000 MW deployed world-wide
- 24 nations have utility-scale geothermal generation
  - US is the world leader, with plants in CA, NV, HI, UT, ID
- Supportive policies have been key to success in all nations

Source: International Geothermal Association



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## Mt. Spurr Geothermal Project



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## Location



West Cook Inlet  
~75 miles west of Anchorage

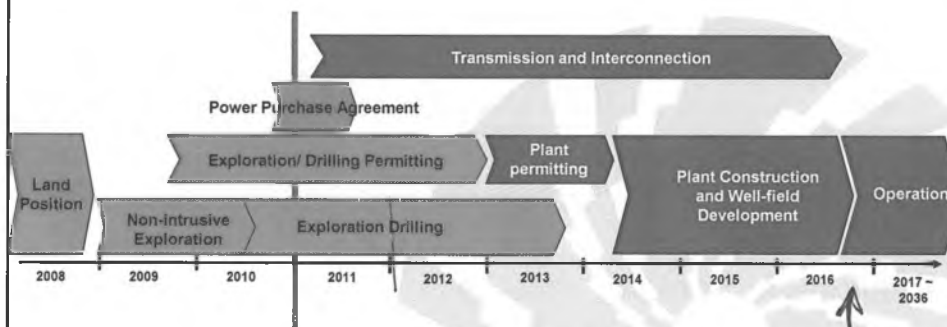
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Source: GoogleEarth

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## 1. Mt. Spurr – Estimated Timeline



- 36,000 acres of state lands leased in October, 2008
- Non-Intrusive exploration conducted summer of 2009 and of 2010
- Two exploration core holes (~1,000 ft) drilled in September 2010

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*2 slim holes*

## Core Drilling



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## Encouraging Results to Date

- Shallow water shows mixing with hot geothermal fluids
- Evidence of multiple geologic faults that could be accommodating geothermal resources at depth
- Geochemistry indicating high temp resource at depth
- But, additional drilling is required in order to confirm the existence of a commercial geothermal resource at depth

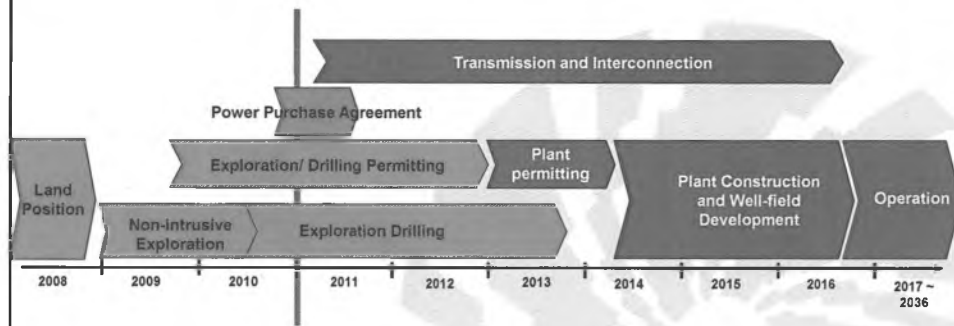
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## Mt. Spurr – Expected Next Steps



- Additional, deeper, (up to 4,000 ft) core holes planned for summer 2011
- First full-size production well planned for 2012

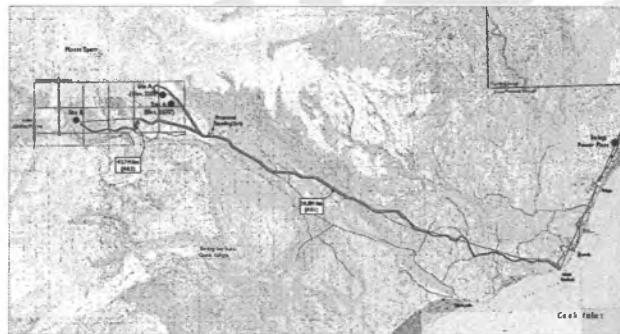
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## 2. Infrastructure Needs

- ~40 miles of T-line to Chugach Electric's Beluga plant
  - Chugach plans to commence a detailed routing study in 2011
- ~25 miles of permanent access road
- \$70 - \$80m



Recommended Alternatives

Legend  
 - - - - - Proposed Transmission Line  
 - - - - - Existing Transmission Line  
 - - - - - Existing Access Road  
 - - - - - Proposed Access Road  
 - - - - - Open Area  
 - - - - - Obstacle  
 - - - - - Obstruction

Scale  
 1:100,000  
 1" = 1 Mile

Mt. Spurr Geothermal

Figure 8

ES&S

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### 3. Expected Amount of Power to Railbelt

- Estimated at 50~100 MW net
- At 95% availability: 416.1 ~ 832.2 GWh / year



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### 4. Likelihood to Completion

- Technology-wise: Very likely
  - Practically no technology risk
  - Ormat has built dozens of plants worldwide, ~1300 MW
- Resource-wise: Likely
  - Preliminary geological analysis is encouraging; however
  - Significant exploration required to prove and size the resource
- Business-wise:
  - Need a Power Purchase Agreement
  - Need State commitment to build transmission line and access road



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## 5. Permitting Roadblocks

- Area was studied by DNR and findings were published as part of the leasing process
- Ormat working with all relevant agencies (DNR, ADEC, AOGCC, USF&WS, etc.)
- All permits for the 2010 exploration and drilling campaigns received on time with no major issues
- No major challenges identified looking forward
  - Little to no impact on wildlife, water sources, wetlands, etc.



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## 6. Project Endorsed by:

- All Railbelt utilities: ARCTEC and ML&P
- Nearest communities:
  - Tyonek
  - Kenai Peninsula Borough
  - Anchorage
- Environmental and renewable energy communities:
  - Cook Inletkeeper
  - Renewable Energy Alaska Project (REAP)
  - Homer Electric Association Members Forum (HEAMF)
  - Alaska Center for Appropriate Technology (ACAT)



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## 7. Ormat Brings the Cash

- Sources of capital for exploration, development and construction:
  - Mostly Ormat equity
  - Awarded \$2 million from the AEA Renewable Energy Grant Fund, round III, matched by \$2.1 million
  - Recommended for an additional \$2 million in round IV
- Ormat typically re-finances plants using term debt

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## 8. Cost of Power to Utility(s)

- 12-13 c/kWh (in 2011 dollars), with 1.5% yearly escalation
- All green attributes will be conveyed to the off-taker(s)
- No additional integration costs to be incurred by utilities
- Price will be guaranteed for 25 years, regardless of fossil fuel costs

*1.5% escalation*

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## 9. Legislative needs

- SB243 (reduction in geothermal royalties on state lands) passed in 2010 removed a major inhibitor
  - Cut the power to ratepayers by close to 1 c/kWh
- Additional incentives, e.g. a 30% refundable tax credit for geothermal exploration and development, are needed in order to get the cost down to utilities' expectations and enable reaching a Power Purchase Agreement ↓ 2.5¢
- Mechanisms will be put in place to make sure that all incentives are passed through to the ratepayer



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## 9. Legislative needs (cont'd)

- \$70-80 million direct appropriation to fund transmission line to Beluga and access road
  - This appropriation will be contingent on:
    - Ormat's success in confirming the geothermal resource
    - Signing a Power Purchase Agreement
- Additional funding to cost-share the expensive 2012 full-size drilling plan



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Thank You!



Mt. Spurr Summit - 6 Aug 2009



Core drilling, September 2010

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27