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# Corporate Presentation

## March 2009

# Panax Geothermal Ltd (ASX: PAX)

- 100% Geothermal Exploration & Development Co.;
- Conventional Geothermal Energy (i.e. existing hot water) = Main Focus;
- Two advanced geothermal projects:
  - **Penola**
    Limestone Coast, S.A.;
    Drilling of production well scheduled for 2nd half 2009; Contract Rig secured.
  - **Puga**
    Himalayas, India.

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# Corporate & Management

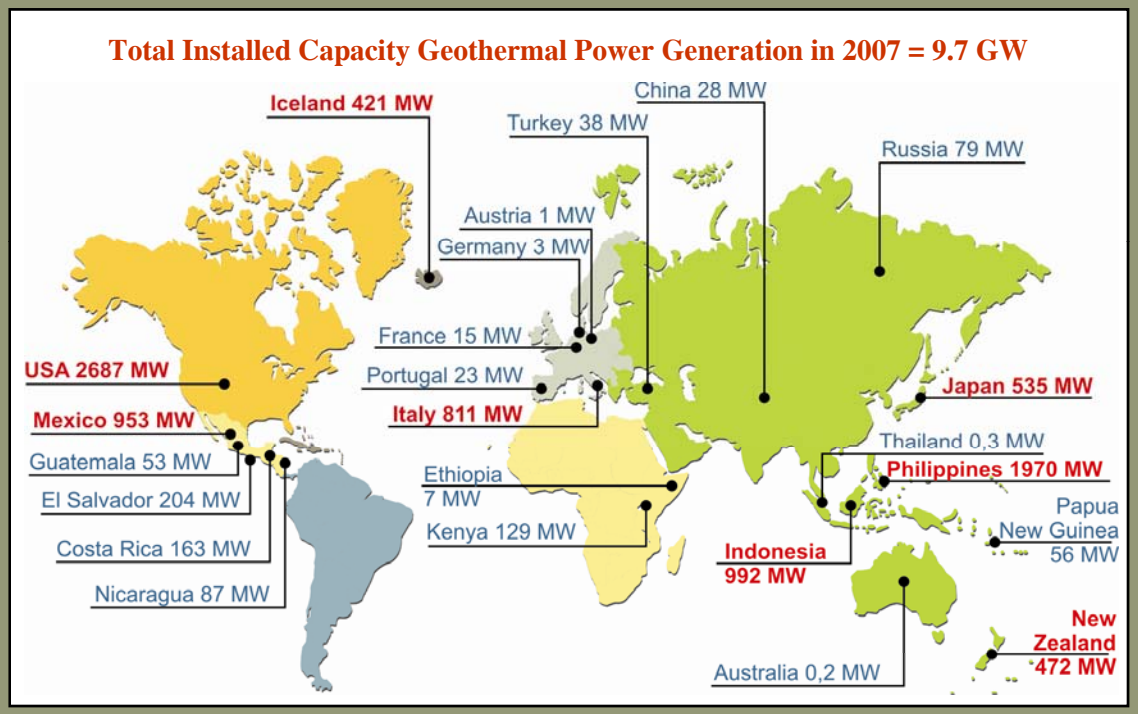
- **Share Capital: 181 Million Shares on issue (ASX: PAX).**
- **Cash Position: AUD $7.0 Million, zero debt, Dec 31, 2008.**

## Experienced Board & Management

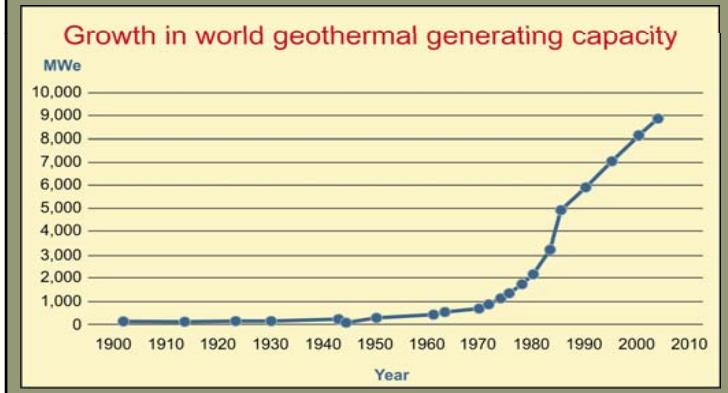
| | |
|---|---|
| Mr. Greg Martyr (Non-Exec. Chairman) | Partner of Gryphon Partners. Ex Normandy Mining Group. Ex Deutsche Bank. |
| Dr. Bertus de Graaf (Managing Dir. & CEO) | Founder and Managing Director of two other Resource Co's (Ross Mining & Geodynamics). |
| Mr. Kerry Parker (Exec. Director, CFO & Co. Secretary) | Ex CFO Arrow Energy. >15 years in Resource development. |
| Mr. Ron Palmer (COO) | Geoscientist with > 20 years in Mineral Exploration. Founder of Osiris Energy & Hot Dry Rocks Pty Ltd. |




# Geothermal Power has a 'Dream Profile' and the Time is Right




**Conventional Geothermal**
**- Hot water from existing reservoirs**




- Zero emissions;
- Base - load power (24 hrs, 7 days per week);
- Competitive power costs e.g. Credit Suisse '09 Report;
- Commercially proven;
- Major incentives e.g. Europe > AUD $300/MW.

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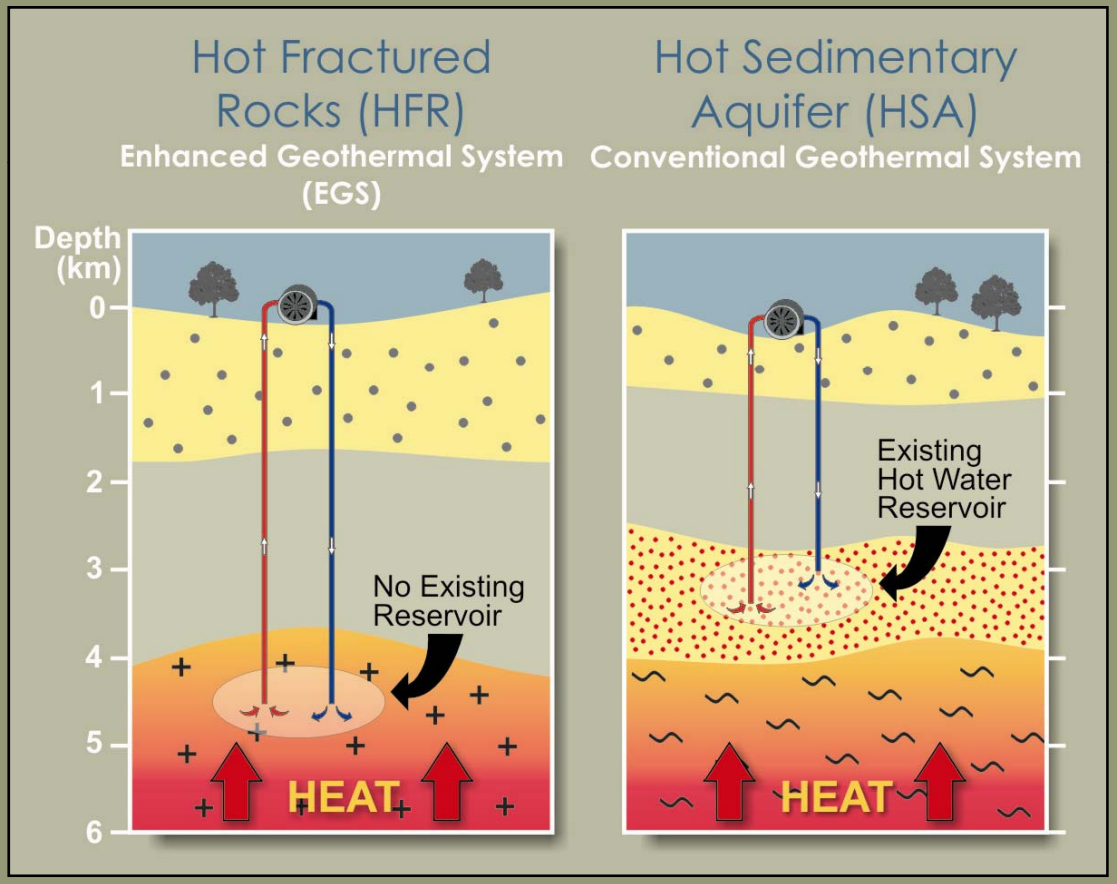
# Geothermal Systems in Australia




| HFR | HSA |
|---|---|
| ■ Heat stored in rocks which need to be opened to create reservoir; | ■ Heat stored in water (brine) in existing reservoir; |
| ■ Reservoir development risk; | ■ Fast development; |
| ■ Long development; | ■ Low costs; |
| ■ High costs; | ■ Commercially proven (>25 years). |
| ■ No commercial operations. | |

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# Panax's Geothermal Interests
## (Focus on Conventional Geothermal Systems)

### Advanced Projects:

- Penola – Limestone Coast, South Australia (100's MW);
- Puga – Indian Himalaya's (50 – 100 MW);


Penola Region


Puga Valley

### Exploration:

- Australia - Limestone Coast Geothermal Project;
  - Cooper Basin, Central Australia;
- Central Asia - Kyrgyz Republic Tajikistan;
- Eastern Europe - Slovakia.

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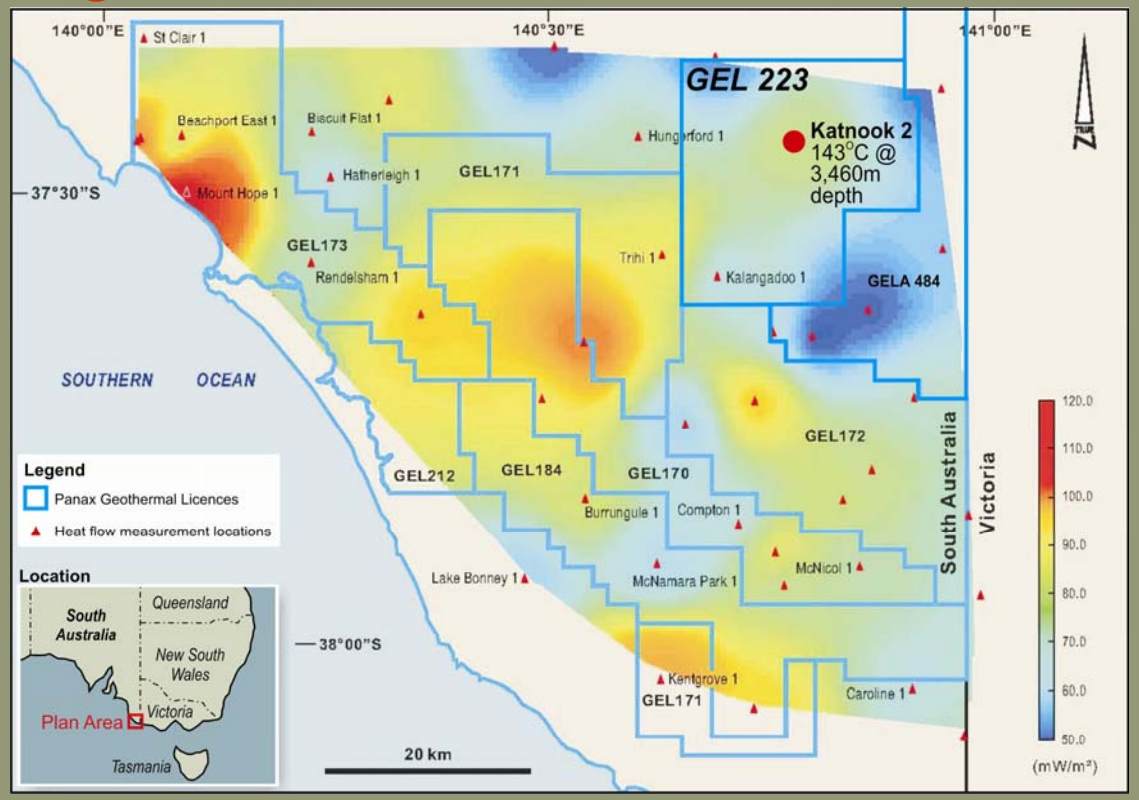
# Limestone Coast Geothermal Project (Otway Basin – Hot Sedimentary Aquifer)

## High heat flow zones




- Dormant volcanic province;
- Deep basement also heat source;
- Studies of existing wells (26 water, 19 gas);
- Confirmed existence of Hot Sedimentary Aquifer;
- Katnook 2 (gas well) recorded 143°C @ 3,460m depths (= GEL 223);
- 5 yrs in preparation.

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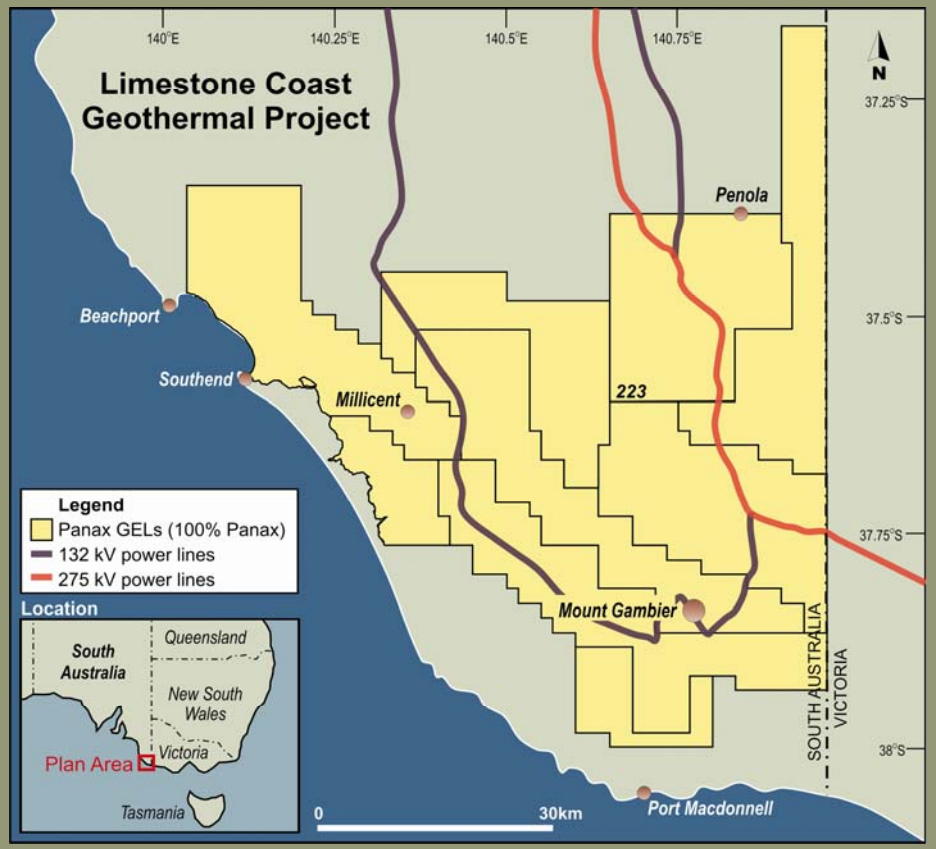
# Limestone Coast Geothermal Project

## Excellent Infrastructure




- Large tenement position (3,000km$^2$);
- Excellent infrastructure:
  - HV power lines overhead;
  - Interstate grid connection on leases;
  - Close to customers.

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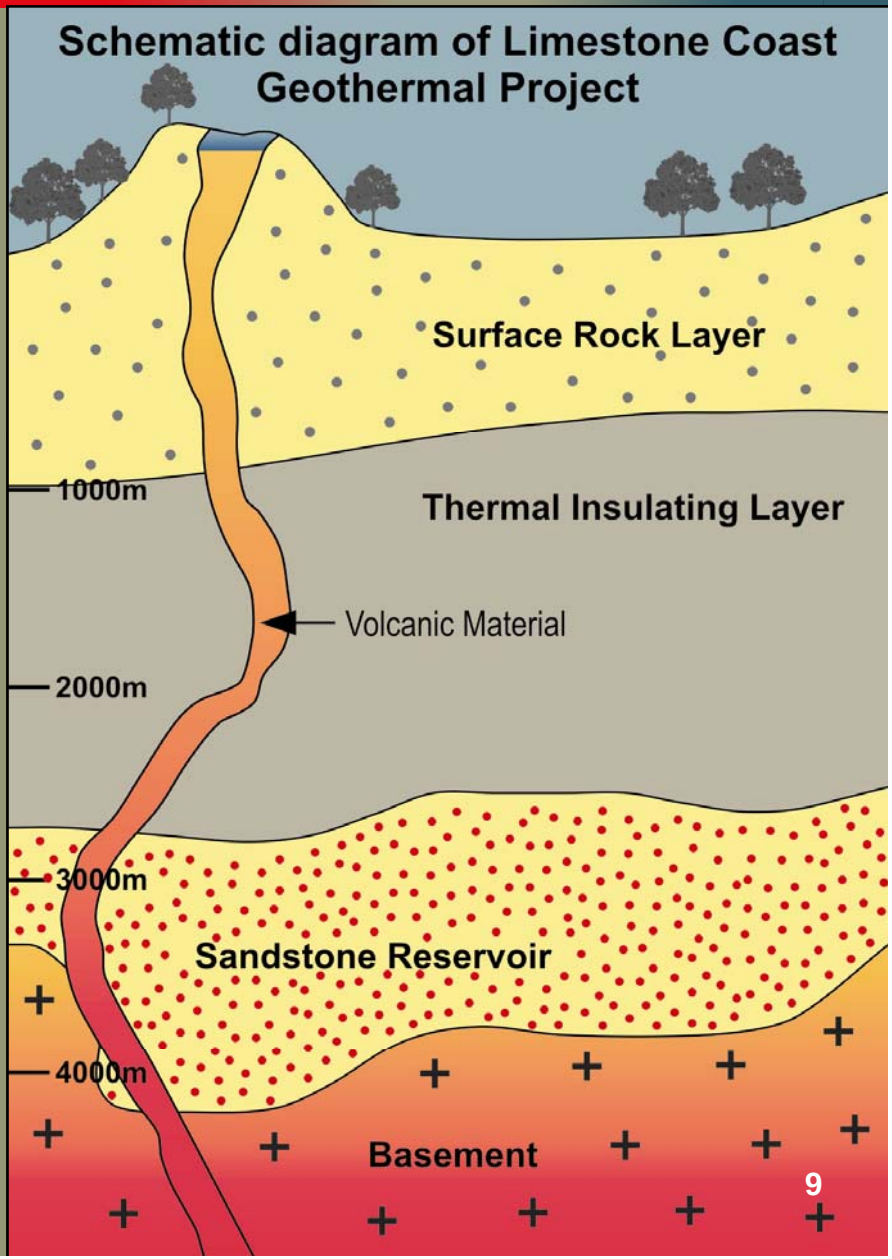
# Limestone Coast Geothermal Project,
## SA - Otway Basin

### Hot Sedimentary Aquifer (HSA) Geological Basis

- **High Heat Flow**
  **(recent volcanism & basement);**
- **Insulating layer**
  **(Eumeralla Formation);**
- **Productive Reservoir**
  **(Pretty Hill Sandstones);**
- **Geothermal temperatures**
  **(150 - 200$^{O}$C @ 3,500m to 4,000m).**



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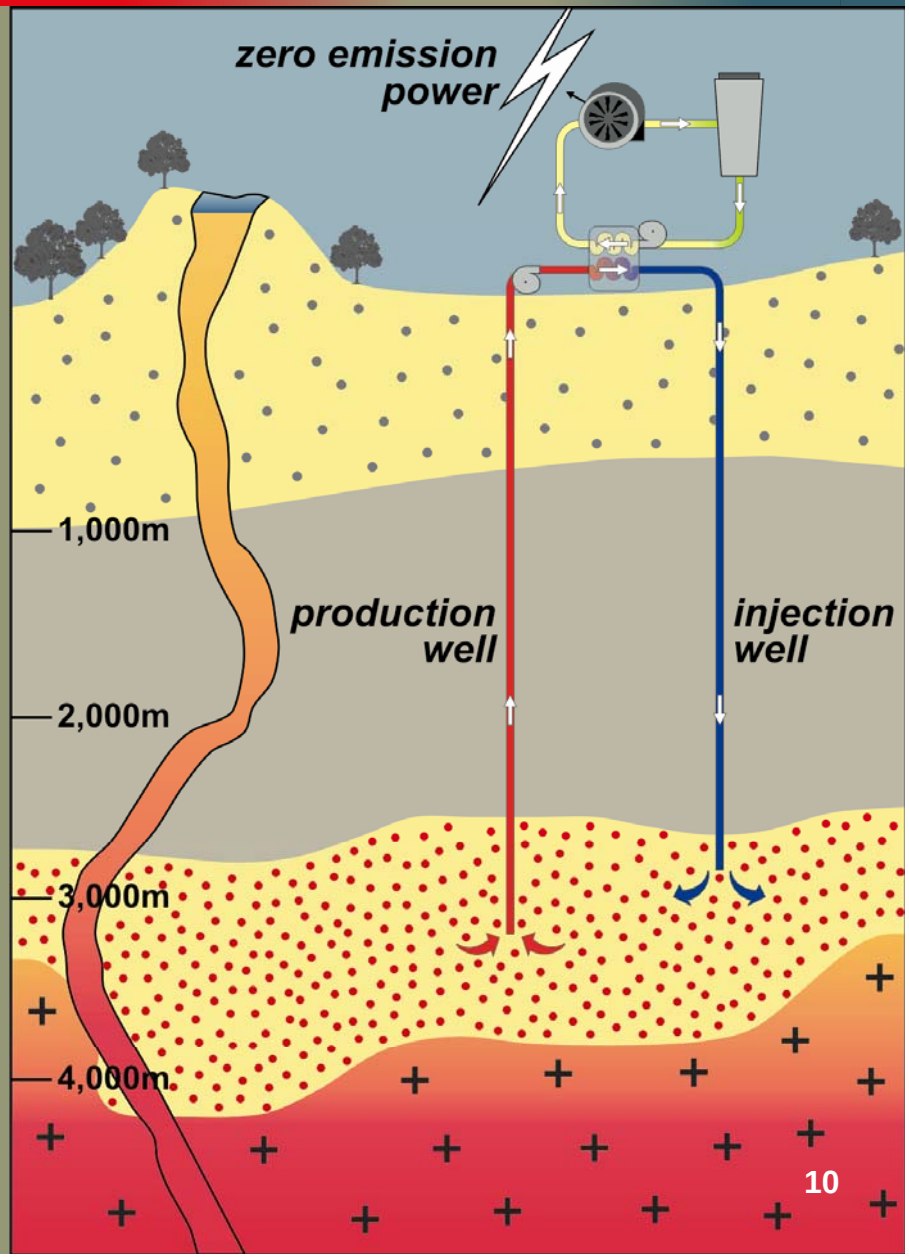
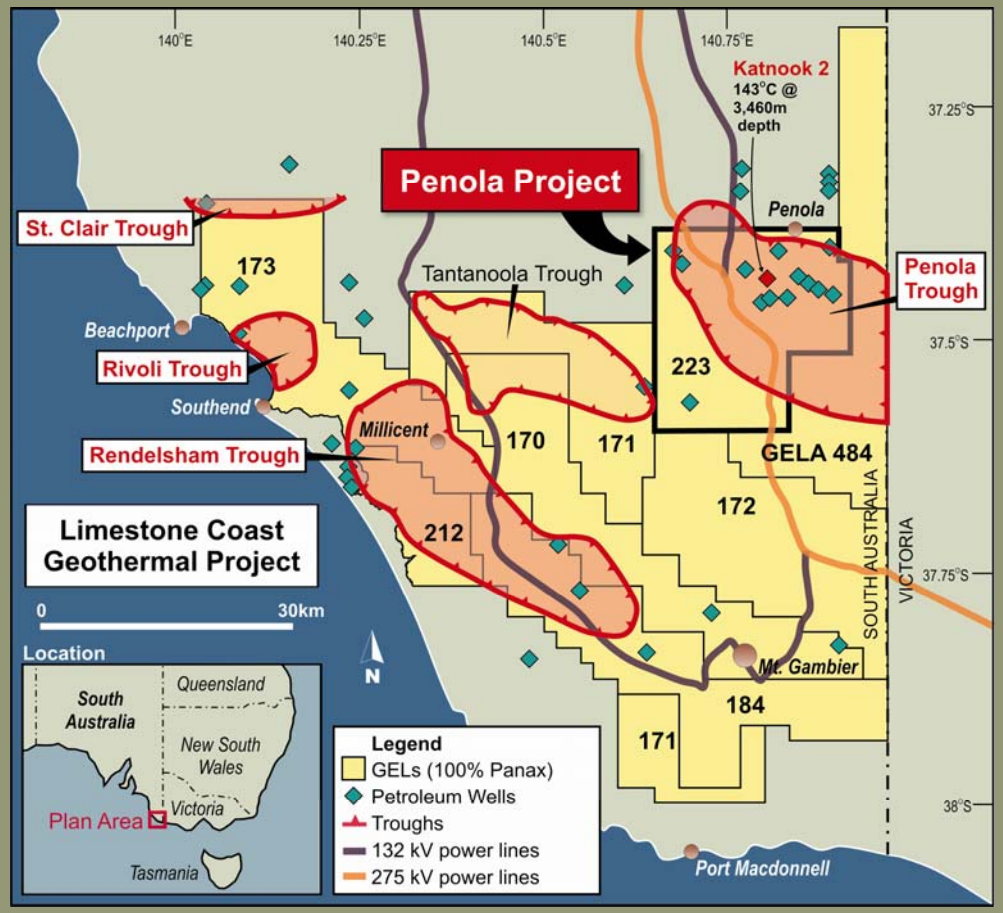
# Limestone Coast Geothermal Project
## - Geothermal Power Generation

- Use of Binary Geothermal Power Plant – ‘closed loop’;
- Off the shelf technology;
- Small environmental foot print;
- One production well at flow rate of 175kg/sec @ 145$^{O}$C (293$^{O}$F) generates 5.9 MWe net power (excluding production pumping power).



# Limestone Coast Geothermal Project
# Geothermal Resource Assessment (AGEA Code)




- Four troughs, target HSA;
- Large potential;
- Excellent infrastructure;
- Geothermal resource estimates for three troughs;
- Penola Trough advanced project – Production well 2nd half 2009.

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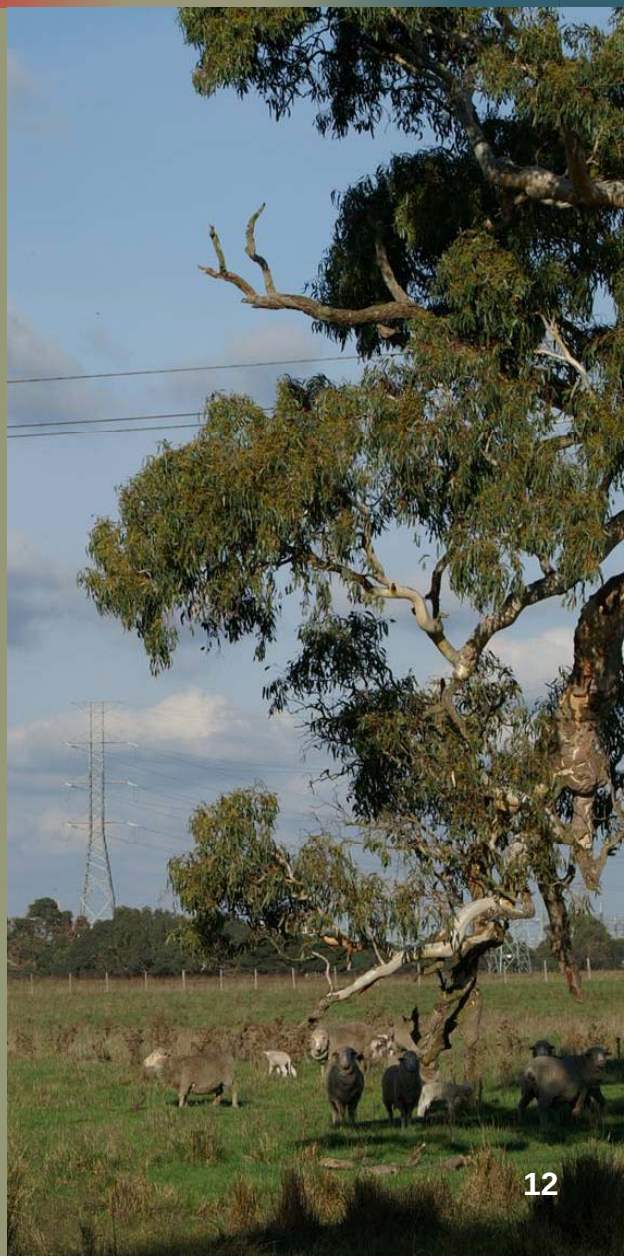
# Independent Geothermal Resource Assessment

## (AGEA code, HDRPL, Jan./Feb. 2009)

| Penola Trough Geothermal Resources*) | | | | | |
|---|---|---|---|---|---|
| Trough | Measured (PJ) | Indicated (PJ) | Inferred (PJ) | Total (PJ) | Report Date |
| Penola | 11,000 | 32,000 | 89,000 | 132,000 | 18/02/2009 |
| Rivoli & St. Clair | | | 53,000 | 53,000 | 28/01/2009 |
| Rendelsham | | | 17,000 | 17,000 | 28/01/2009 |
| Tantanoola | | | | | |
| Total | 11,000 | 32,000 | 159,000 | 202,000 | |

*) by Dr. Graeme Beardsmore of HDRPL

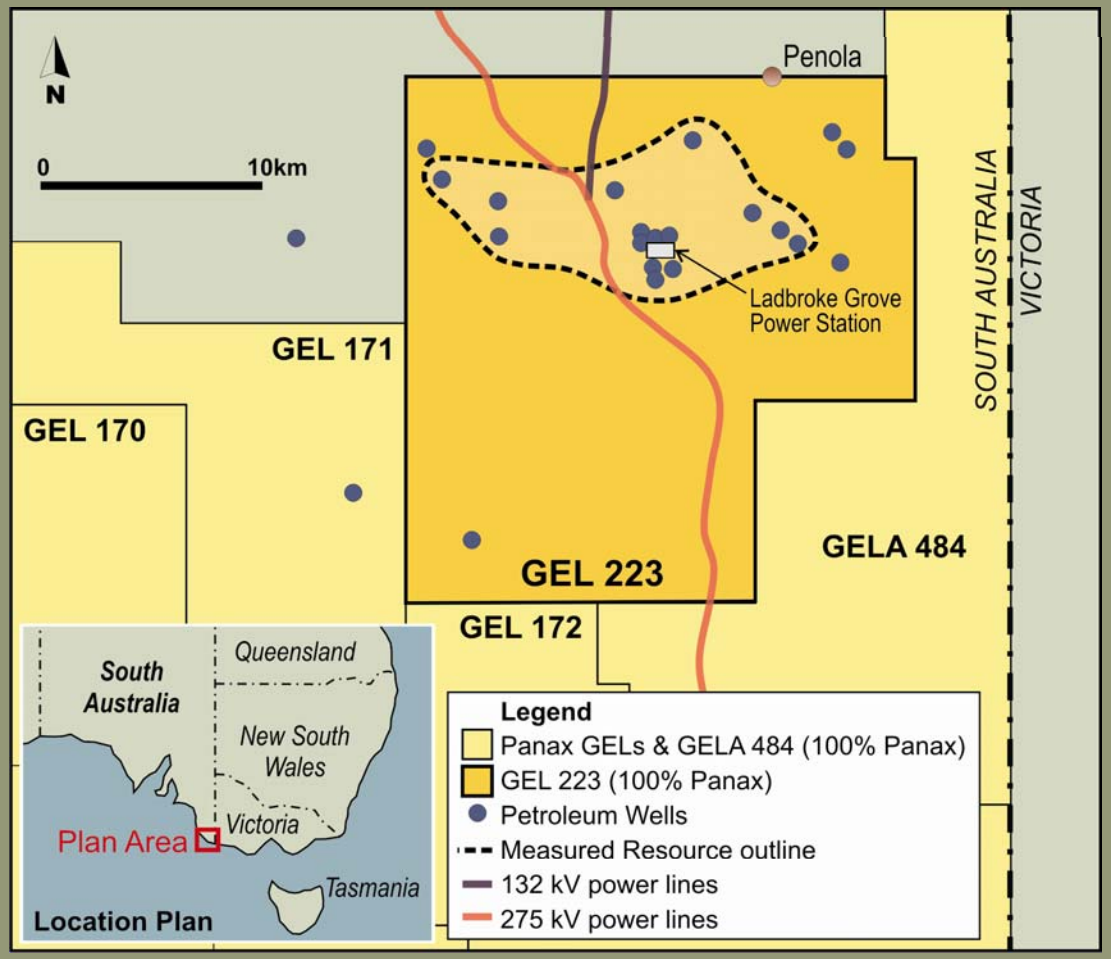
- Large scope of Limestone Coast Project;
- Penola Trough “Measured Resource” the largest in Australia; one out of two;
- 1,000 PJ sufficient for 100 MW power station for 30 yrs;
- Drilling to commence in 2nd half 2009.



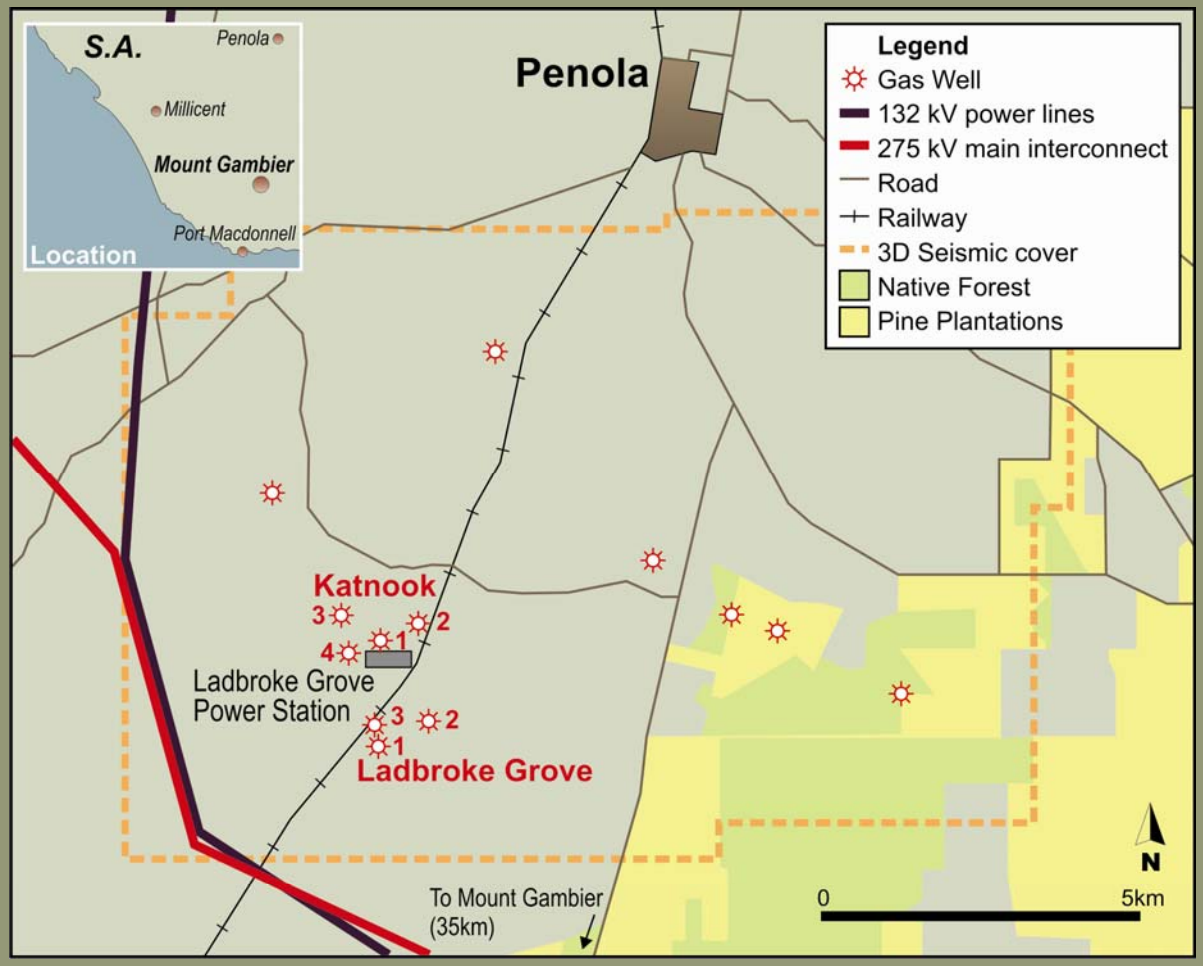
# Penola Project – Measured Geothermal Resource

**Measured Geothermal Resource = 11,000 PJ**

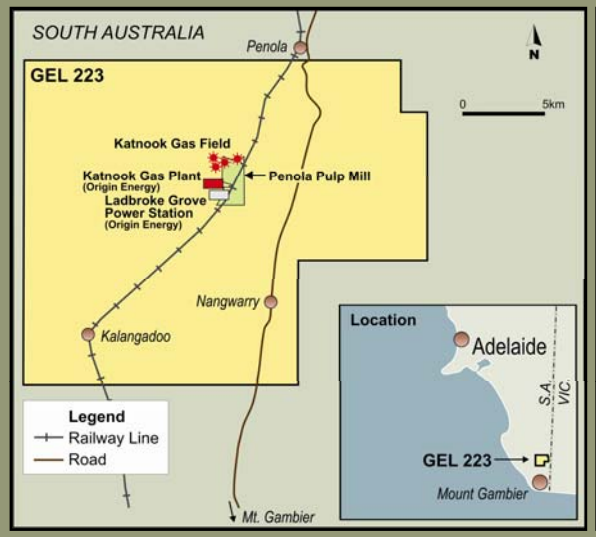
- **"Measured Resource" restricted to top 800m of Target Reservoir;**
- **28 deep petroleum wells + logs + core + Bottom Hole Temperatures (BHT);**
- **Deepest wells approx. 3,500m or >600m of target reservoir penetrated;**
- **400 km$^2$ 3D seismic;**
- **1,000 km 2D seismic.**



# Penola Project Regional Map




- **Excellent infrastructure:**
  - **National & State grid;**
  - **Tarmac roads;**
  - **Flat terrain;**
  - **Local gas fired station & substation (86 MW);**
  - **Note 3D seismic cover;**
  - **Mt. Gambier Airport.**


SOUTH AUSTRALIA
Penola
N
GEL 223
0
5km
Katnook Gas Field
Katnook Gas Plant
(Origin Energy)
Penola Pulp Mill
Ladbroke Grove
Power Station
(Origin Energy)
Nangwarry
Kalangadoo
Location
Adelaide
S.A
VIC
Legend
Railway Line
Road
GEL 223
Mount Gambier
Mt. Gambier


STOP
STOP

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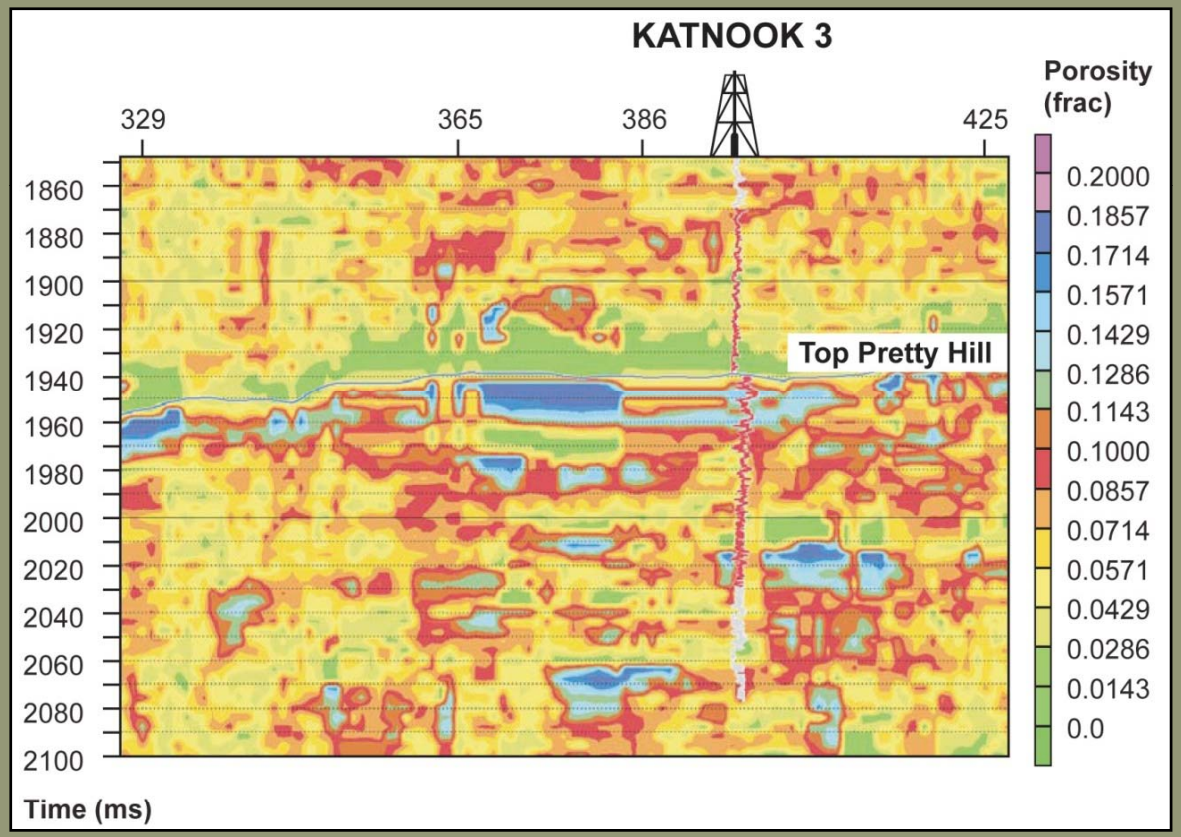
# 3D Seismic & Pretty Hill Formation Target Reservoir, Penola Project (GEL 223)

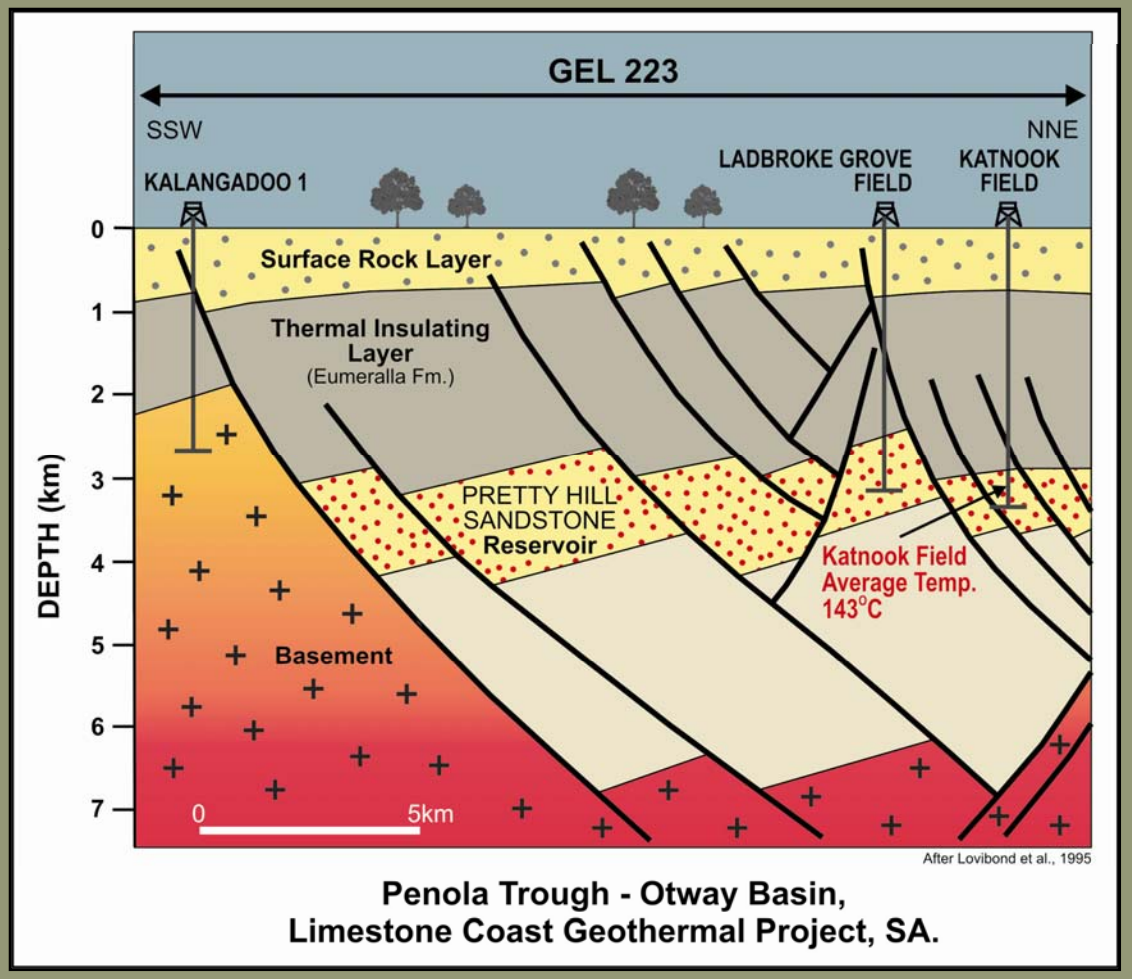
- 600m of Pretty Hill Sandstone intersected; total thickness 1,000m;
- Measured porosity/permeability 10 - 50 Darcy–metres;
- Flow rates >175kg/sec can be achieved.




(Dark blue = >18% porosity in Pretty Hill Formation, our target rocks)

# Penola Project Petroleum Wells & Seismic Data Provide Certainty

- Confirmation of Reservoir Permeability/Porosity (175kg/sec);
- Confirmation of minimum temp. (+/- 145$^{O}$C or 293$^{O}$F);
- Production well 175kg/sec ➡ 4.5 MW net plant, net pumps;
- Total cost per MWh (capex & opex) approx. AUD$63 per MWe (<< wind power).




Penola Trough - Otway Basin,
Limestone Coast Geothermal Project, SA.

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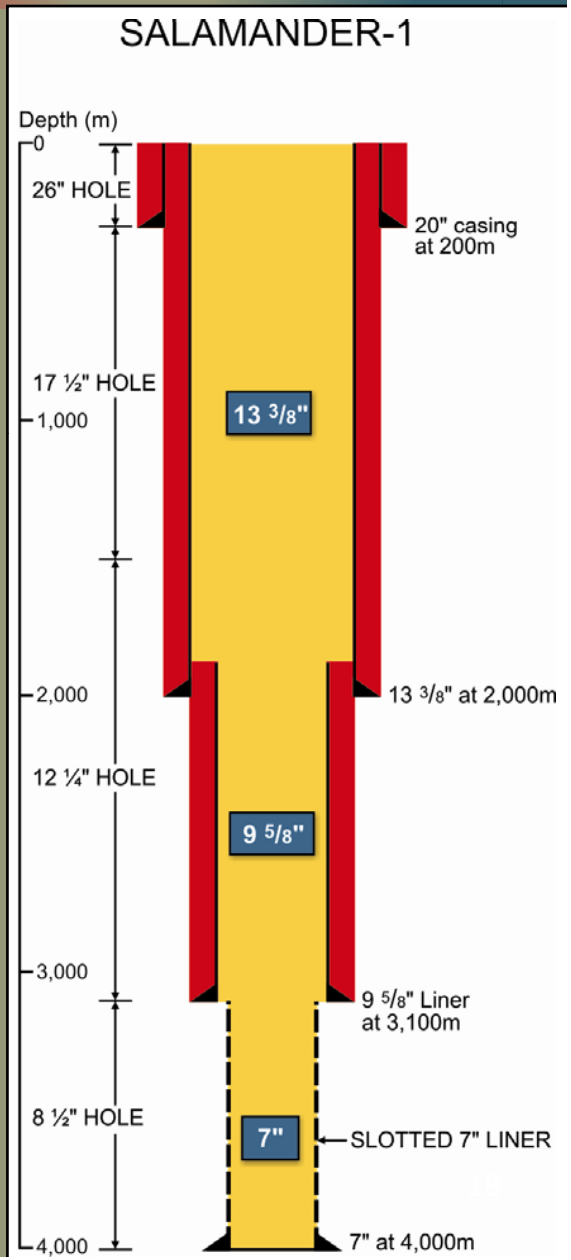
# Drilling Salamander-1

- First well to demonstrate conventional geothermal energy in Australia;
- Drilling slot secured for early 2nd half-2009 (Steam!);
- Well design completed;
- Designed as production well;
- Off set data from more than 20 deep wells;
- Well cost estimate AUD$12 M.



# Penola Project – Pre-Feasibility Study

**BASE CASE**
(Binary Geothermal Power Plant)

| | |
|---|---|
| **Flow** | **175 kg/sec** |
| **Brine Temp.** | **145$^{O}$C (293$^{O}$F)** |
| **Injection Temp.** | **70$^{O}$C (158$^{O}$F)** |
| **Ambient Temp. 1)** | **16$^{O}$C (61$^{O}$F)** |
| **Gross Output 2)** | **6.7 MWe** |
| **Net Plant Output 2) (MWe)** | **5.9 MWe** |
| **Net Plant / Net Pumps Output (MWe)** | **4.5 MWe** |

1) Aust. Bureau of Meteorology.
2) As supplied by ORMAT.

## Target Reservoir

**Temp. & Reservoir quality known from open file data base**

# Penola Project – Pre-Feasibility Study

| | Total Costs per MWh *) (Capital & Operating Costs) | | |
|---|---|---|---|
| | Total No. Prod. Wells | Net/Net output **) (MW) | Total Cost (MWh) AUD |
| Demonstration Plant | 1 | 4.5 | $79 |
| Phase 1 Plant | 3 | 13.5 | $65 |
| Phase 2 Plant | 10 | 45.0 | $63 |

*) 30 year life; 95% availability; no financing costs.

**) Net/Net = power output net of plant & net of pumps.

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# Penola Project – Pre-Feasibility Study
# Capital & Operating Costs

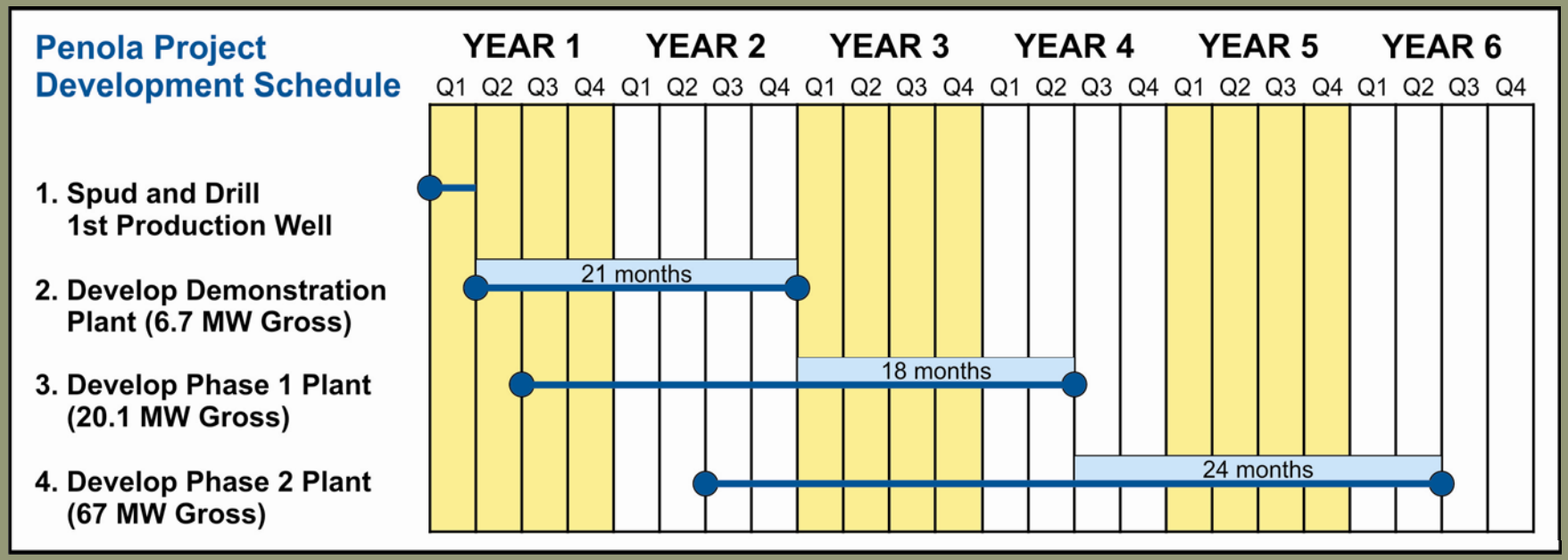
| Capital & Operating Costs per MWh (Phase 2 Plant, AUD $'s) | |
|---|---|
| Capital Costs | $51 |
| Operating Costs | $12 |
| Total Costs | $63 |
| Grid Connection | $2 |
| Total | $65 |

**Capital Costs per MW Installed Capacity (AUD$ Million)**

| | |
|---|---|
| Gross output basis: | $7.0 M |
| Net / Net output basis: | $10.8 M |

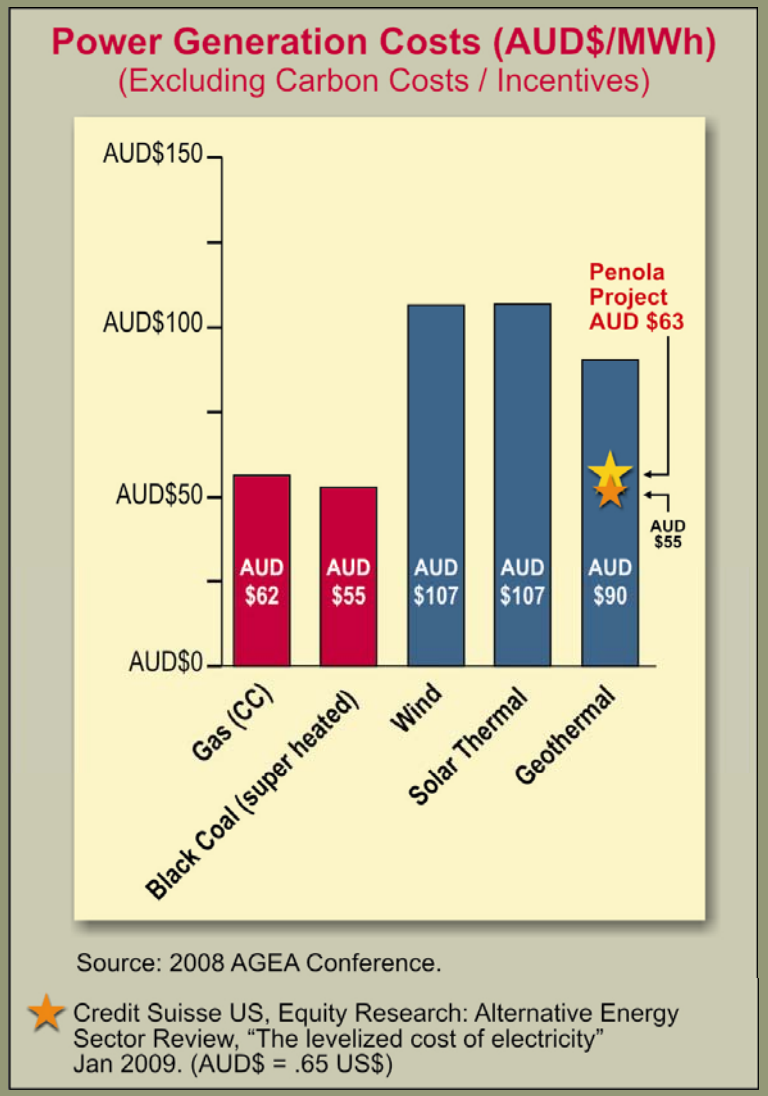
# Penola Project Development Schedule

- Spud Salamander-1 Aug./Sept. 2009;
- Grid connected Demonstration Plant – 2nd half 2011.

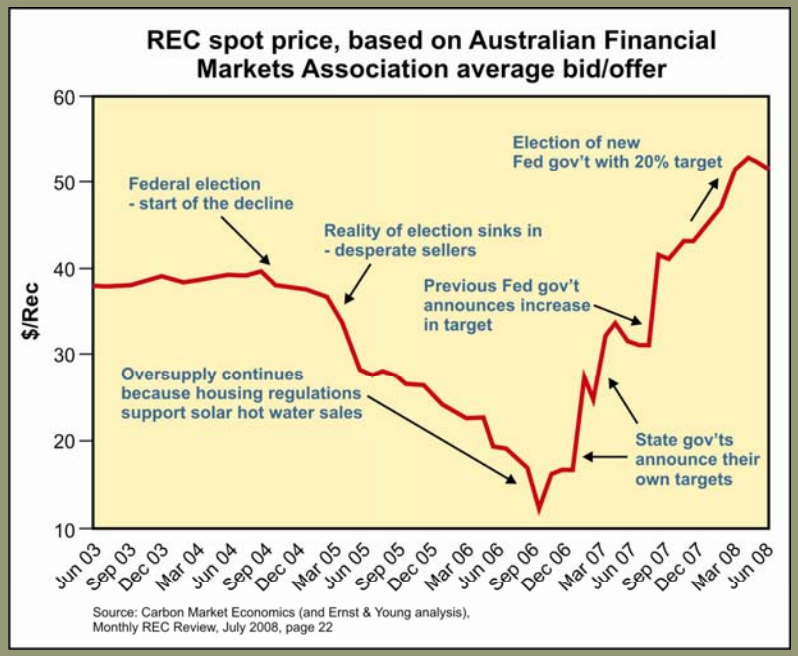


# Penola Project in Context – Unique Position

- Measured Resource of 11,000 PJ;
- Reservoir quality and reservoir temperature known;
- Total Cost per MWh (net plant & net pumps) of AUD $63;
- Excellent Infrastructure – within sight of the grid – connection costs +/- AUD $2 per MWh;
- Zero emission base-load power;
- Rapid development profile.



# Clean Electricity Price - Geothermal well placed




- Australian Government committed to renewable energy target - 20% by 2020;
- Requires $23 billion of new investment (ESAA, 2008);
- MRET set at 9,500 GWh by 2010, increasing to 45,000 GWh by 2020;
- Current REC spot price approx. A$50 MWh (06/03/09);
- Penola project (Limestone Coast) well placed to benefit with ‘clean’ electricity price of AUD$100 per or more MWh;
- Commercially attractive.

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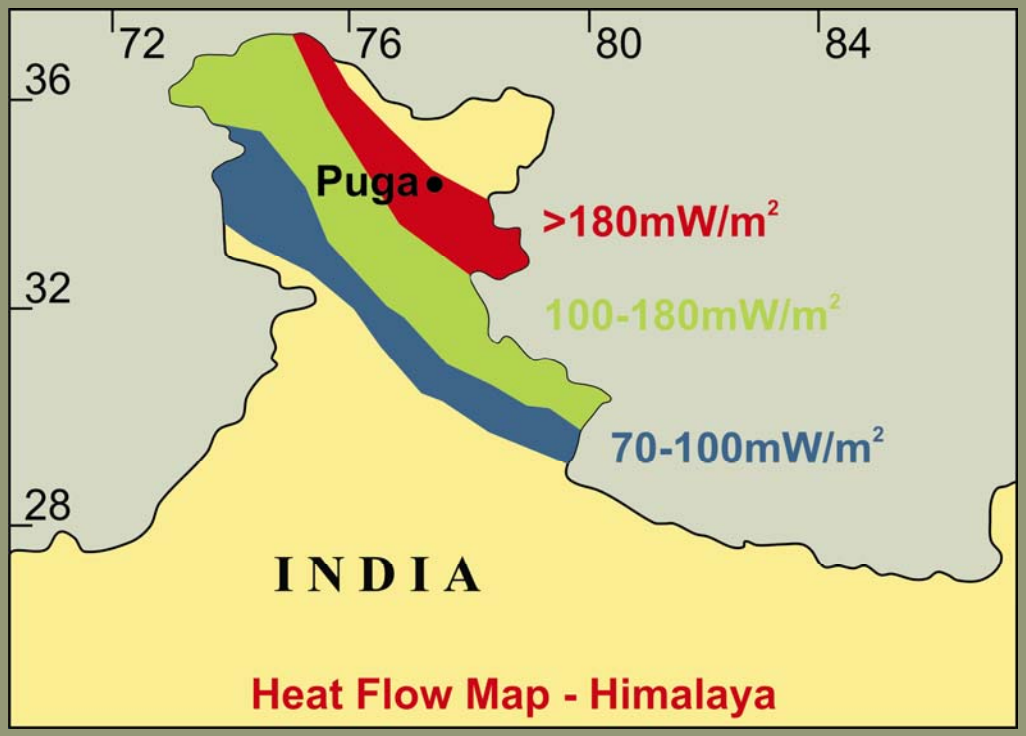
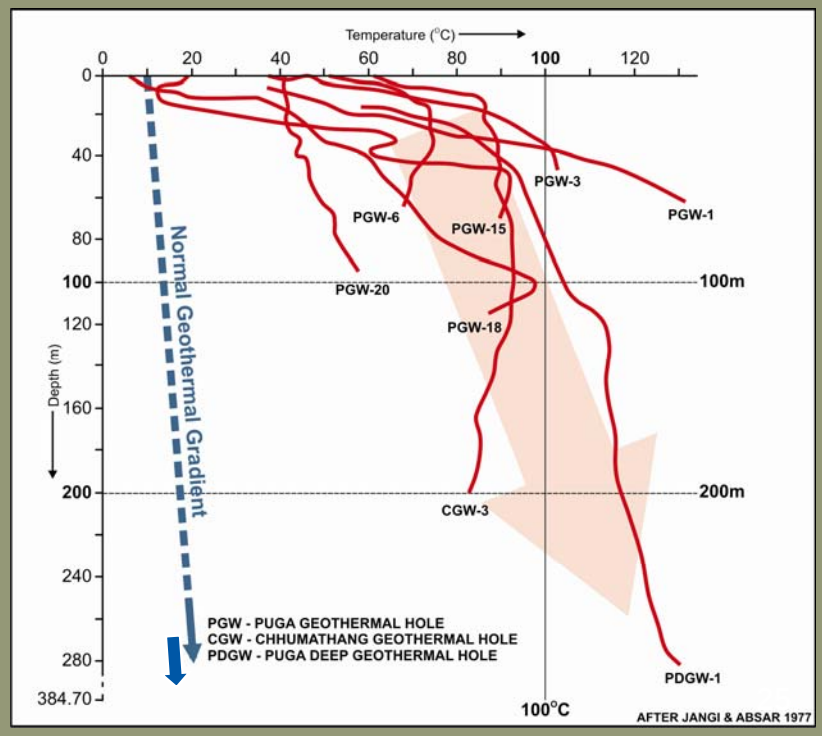
# India: Puga Project

- **Himalayan Geothermal Province;**
- **Located in extreme high heat flow zone;**
- **UNDP drill testing 1970's.**




Geothermal waters @ >120°C @ 200m



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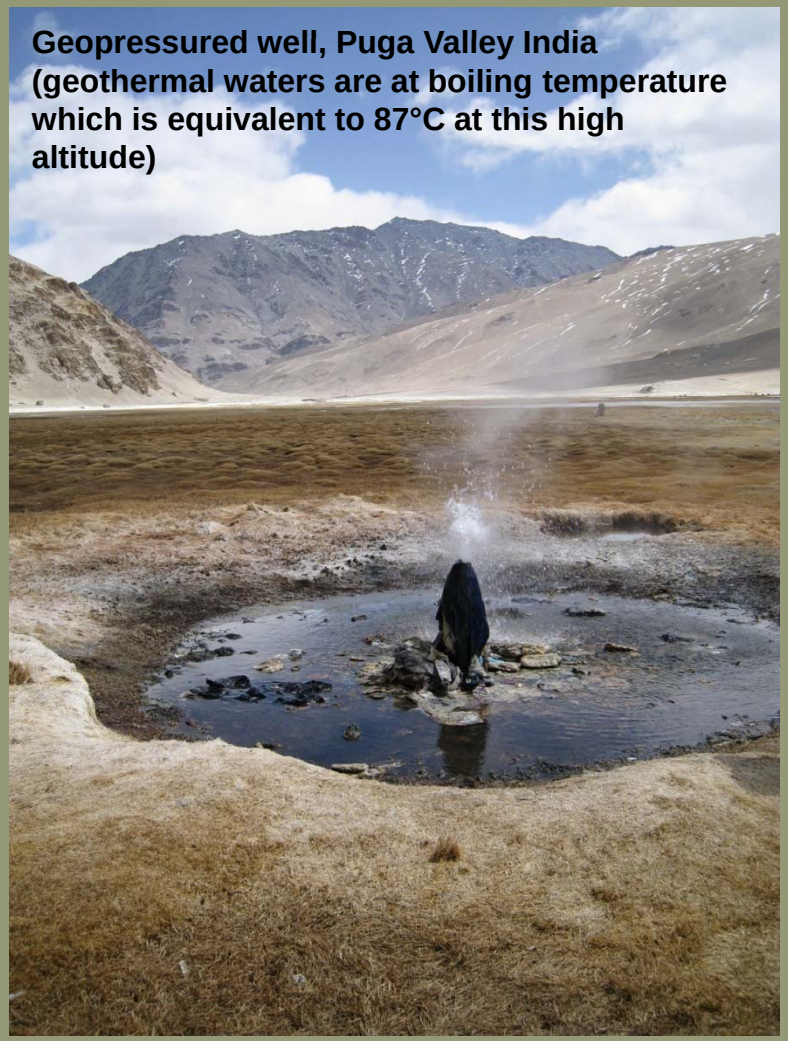
# Puga Project - Himalayan Geothermal Province

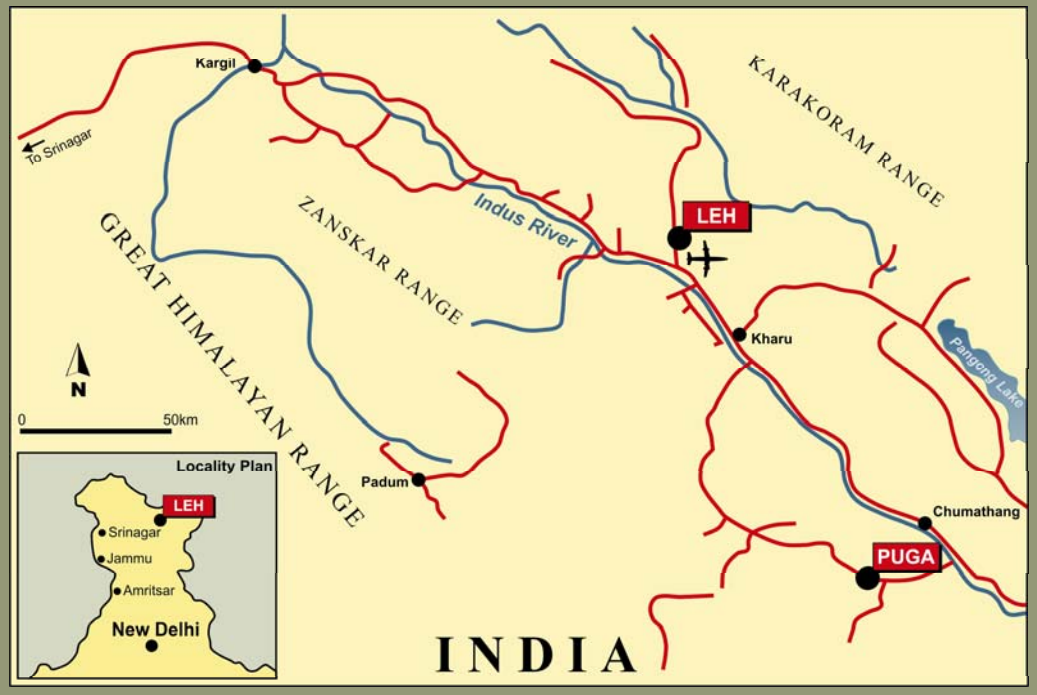
- Earning up to 49% in Puga project (AUD$6 M);
- Known geo-pressured geothermal wells (UNDP – 1970's);
- Extreme geothermal gradients (e.g. 1.2km 250ºC);
- Analogue to Yangbajing geothermal province in Tibet (35 MWe);
- Ready for development (low risk);
- Potential World Bank support, PRI;
- Commercially attractive power tariffs plus CDM.



Geopressured well, Puga Valley India (geothermal waters are at boiling temperature which is equivalent to 87°C at this high altitude)

# India: Puga Project – Location Map

- Puga - Leh = distance of 140km;
- Leh - ‘tourist’ capital of Indian Himalaya’s;
- Leh relies on diesel generation (13 MWe) and small scale hydro (2 MWe);
- Current demand 59 MWe;
- Regional support;
- Attractive power tariffs;
- No social / environmental issues.



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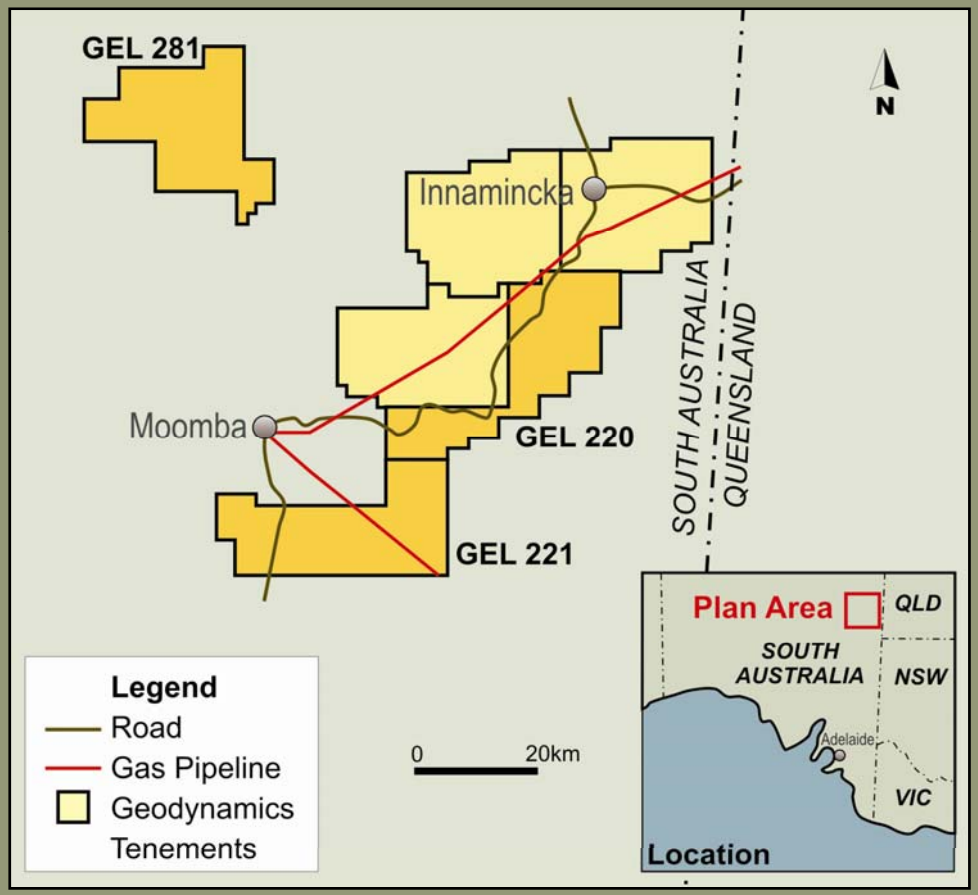
# Cooper Basin Region Tenements

- **GEL 220 & 221**
  - geothermal temp. >260°C @ <3,900m, many drill holes, various heat exchangers.

- **GEL 281**
  - Temperatures 120 - 150°C (shallow HSA);
  - Many oil / gas wells;
  - Local power requirements.



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# Kyrgyz Republic – Central Asia

- JV with Kentor Gold Limited (ASX: KGL), earning up to 61% in six geothermal licences; JV extends to other countries Central Asia;
- Extreme high heat flows and geothermal gradients;
- High quality Soviet era database;
- Widespread occurrence of thermal springs;
- Government support – World Bank interest;
- Extensive transmission grid, regional power shortages, net exporter of power;
- Connected to Eurasian rail network.


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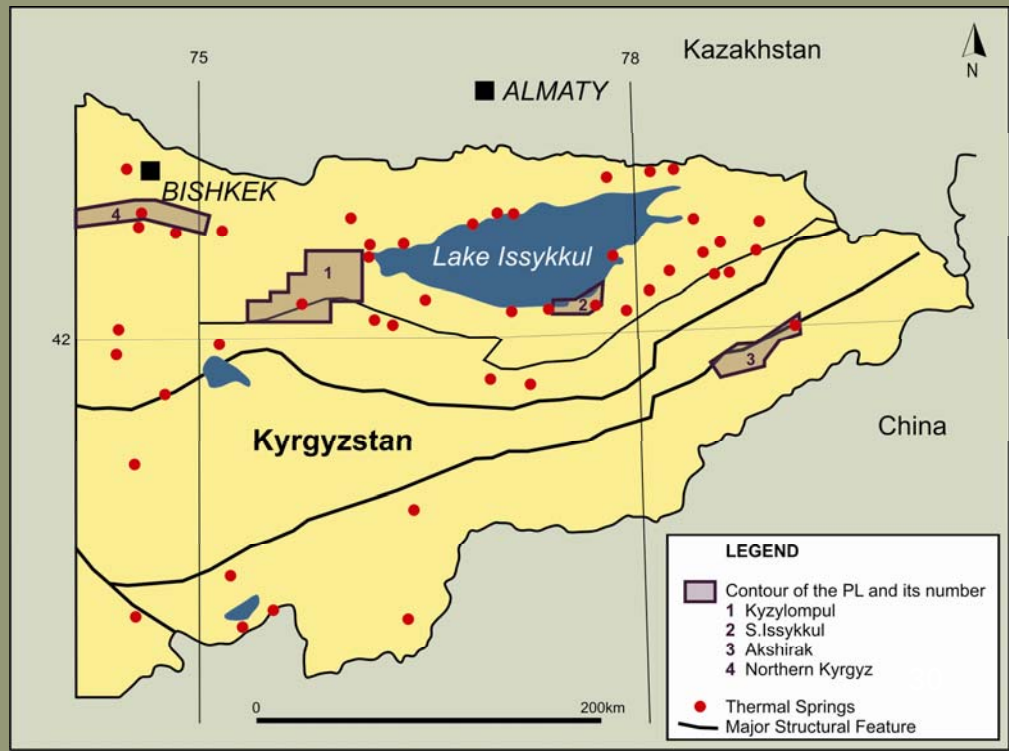
# Geothermal JV Tenements and Hot Spring Locations

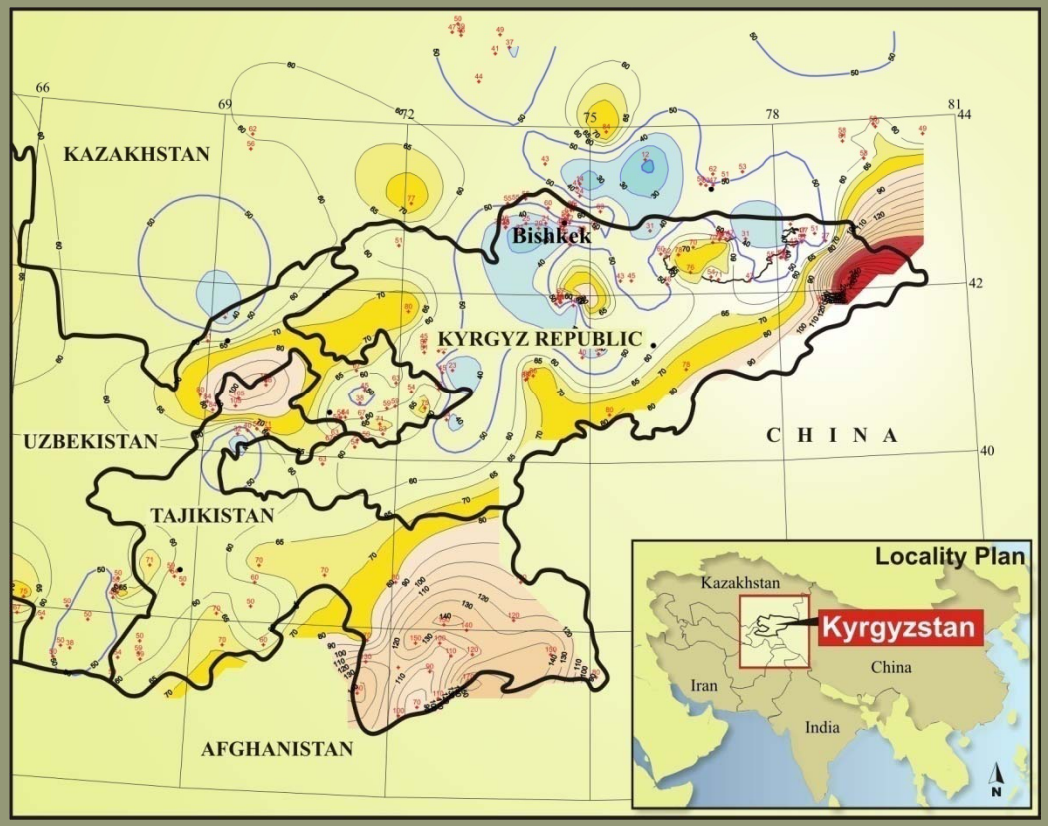
- Lake Issykkul – fresh water lake never freezes despite minus 35°C in winter – high heat flows;
- Widespread occurrence of thermal springs;
- Extreme high heat flow anomaly in East of country;
- Potential district heating applications.



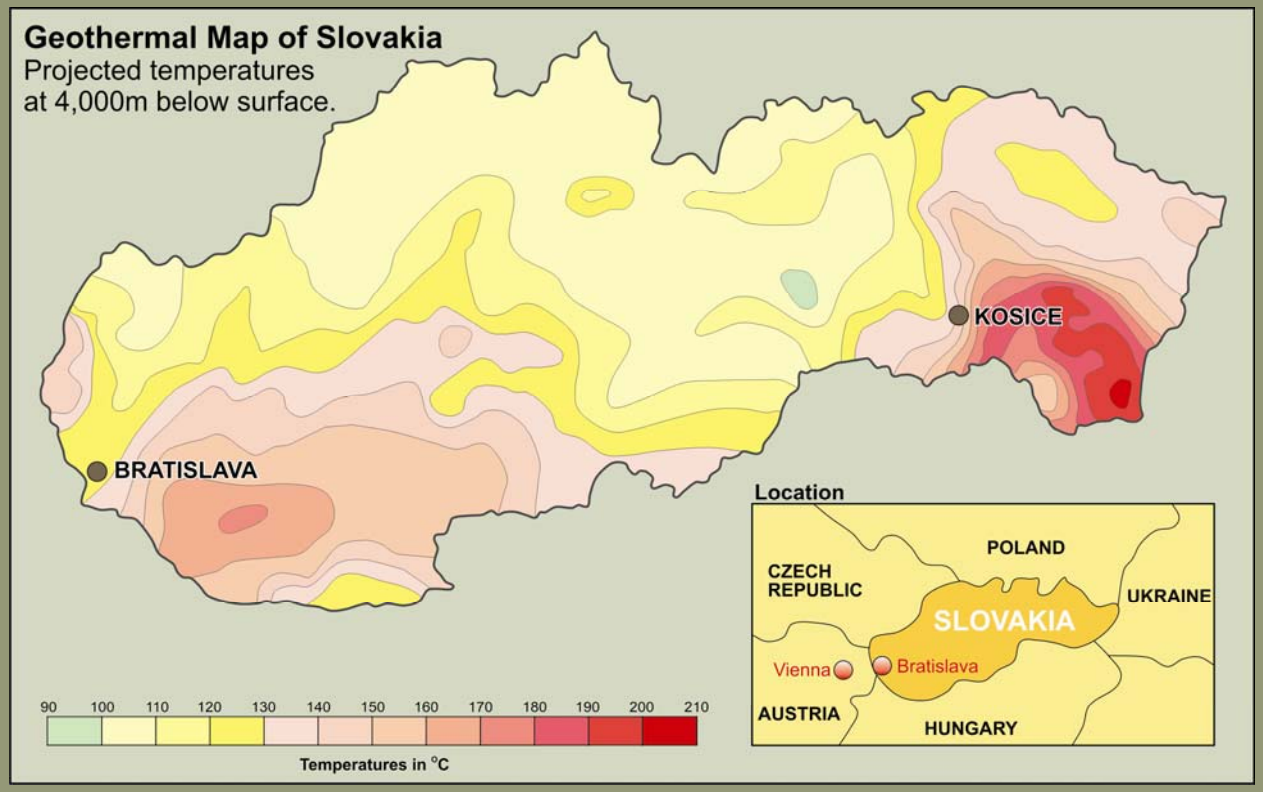
# Heat Flow Map of Central Asia

- Extreme geothermal gradients (>100° C/km) have been observed in Akshirak PL, East Kyrgyz Republic;
- Tien Shan Mountain range may be linked to Himalayan style geothermal resources;
- Evaluation of this anomaly in progress (Inylchek, Akshirak licence).

Central Asia Heat Flow Data Points and Contours



# MOU – GeoPark Slovakia




- **Hot sedimentary aquifer targets;**
- **Option to earn 75% in new licences;**
- **AUD$385 per MWh guaranteed for 30 years.**

# Summary

- Panax established as a Geothermal Company with National and International interests focusing on conventional geothermal energy;
- Limestone Coast Geothermal Project has large potential;
- Penola Project is associated with a ‘Measured Resource’ of 11,000 PJ sufficient for  100’s of MW’s of power generation.

# Summary *continued*

- **Panax is only one out of two Australian Companies with wells within target reservoir and with a 'Measured Geothermal Resource';**
- **Independently reviewed pre-feasibility study shows Penola project could generate low cost power (total cost of AUD$63 / MWh);**
- **Penola production well scheduled to spud in September, 2009;**
- **Penola Demonstration plant could become first grid connected geothermal power plant in Australia (late 2011).**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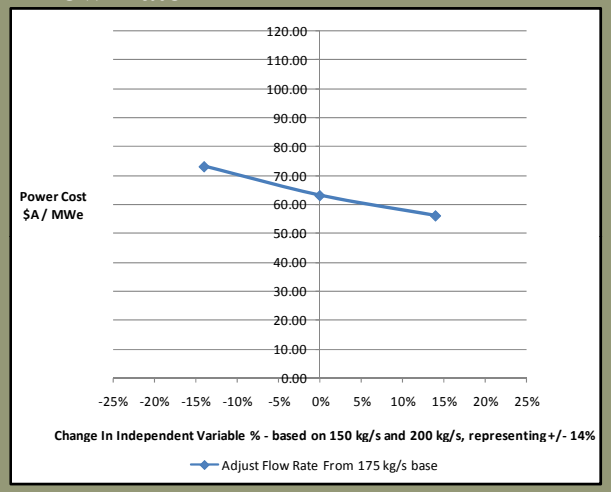
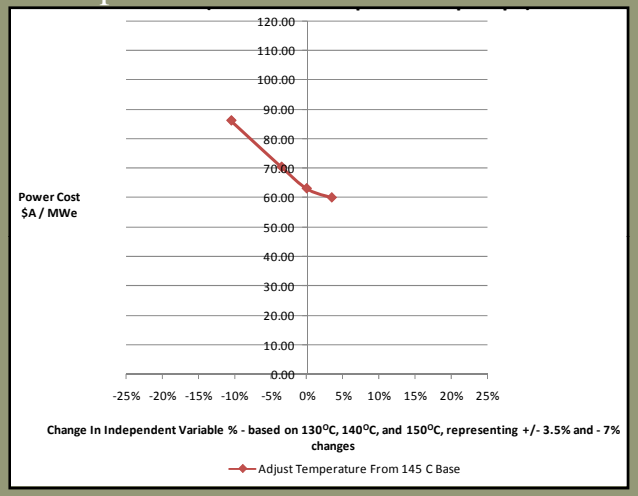
# Penola Project - Sensitivity Analyses

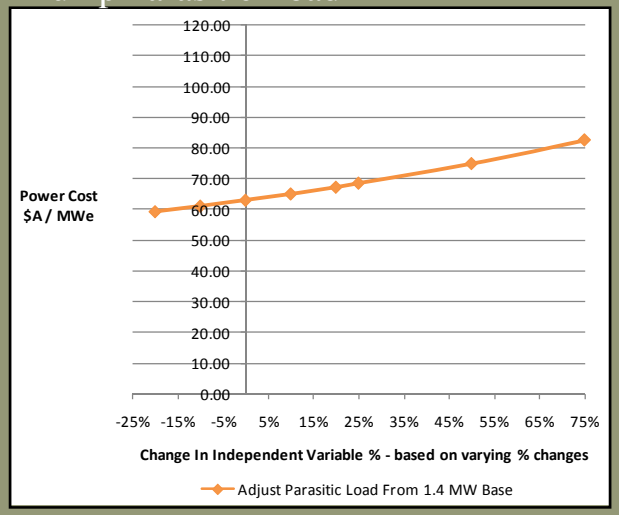
## Flow Rate




## Temperature




## Pump Parasitic Load




## Capex & Opex