

# ASX Release

3 December 2009

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ABN 17 106 806 884

Level 1, 129 Greenhill Road  
Unley SA 5061

**T:** +61 8 8274 5000

**F:** +61 8 8272 8141

**W:** [www.petratherm.com.au/](http://www.petratherm.com.au/)

**E:** [admin@petratherm.com.au](mailto:admin@petratherm.com.au)



**PETRATHERM LIMITED**  
**ABN 17 106 806 884**

## MD presentation to Investors

Petratherm's Managing Director, Terry Kallis, will today present an update on the Company's activities and projects to investors, including financial institutions and brokers in Sydney.

Key points from the presentation include:

- Key achievements over the past year
- An update on the Paralana drilling campaign and key factors for success of the Paralana 2 deep well
- An outline of the economic assumptions underlying the Paralana geothermal energy project
- An outline of the Paralana joint venture arrangements and an explanation of the mechanics of the joint venture in respect of the 30 MW demonstration project and the recent \$62.8 million Renewable Energy Demonstration Program grant
- Longer term solution for transmission for large scale development from Paralana to Olympic Dam
- Progress in Spain across Madrid, Barcelona and Tenerife, notably the current magnetotelluric survey and potential joint venture
- Outlook for the Company over 2010 and in particular for the Paralana project.

The presentation is attached.

Yours faithfully

**Terry Kallis**  
Managing Director

### **MEDIA CONTACTS:**

Terry Kallis  
Kieran Hall / Tim Hughes

Petratherm Ltd  
Hughes Public Relations

08 8274 5000  
08 8412 4100

# Petratherm

## Investor Presentation

Company and Projects Update

Presented by Managing Director Terry Kallis

**3 December, 2009**

# CLEAN ENERGY FOR FUTURE GENERATIONS

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All amounts in Australian dollars (AUD) unless stated otherwise.

# Presentation Overview

- > Company and Projects Update
  - > Recent Achievements
  - > Paralana JV project
  - > East Gippsland
  - > Spain – Madrid, Barcelona and Canary Islands
  - > China
- > Outlook for 2010 and beyond

# Our company



## Our company

- > Leading Australian geothermal exploration and development company
- > Projects spanning Australia, Spain and China
- > Flagship project – Paralana

## Other growth projects:

- > Madrid
- > Barcelona
- > Canary Islands, Tenerife
- > Victoria's East Gippsland Basin
- > China exploration agreement

# Corporate and financial

## Listed ASX:PTR

- > Shares on Issue: 94.45 million
- > Share Price: \$0.40 (1 Dec)
- > Market Cap: \$37.8 million (1 Dec)
- > Cash Position: \$8.7 million (23 Nov)
- > Shareholders: 3,554 shareholders
  - > Minotaur Exploration 22.0 %
  - > Australian Ethical Investments 4.8 %

## Paralana Funding and Grants

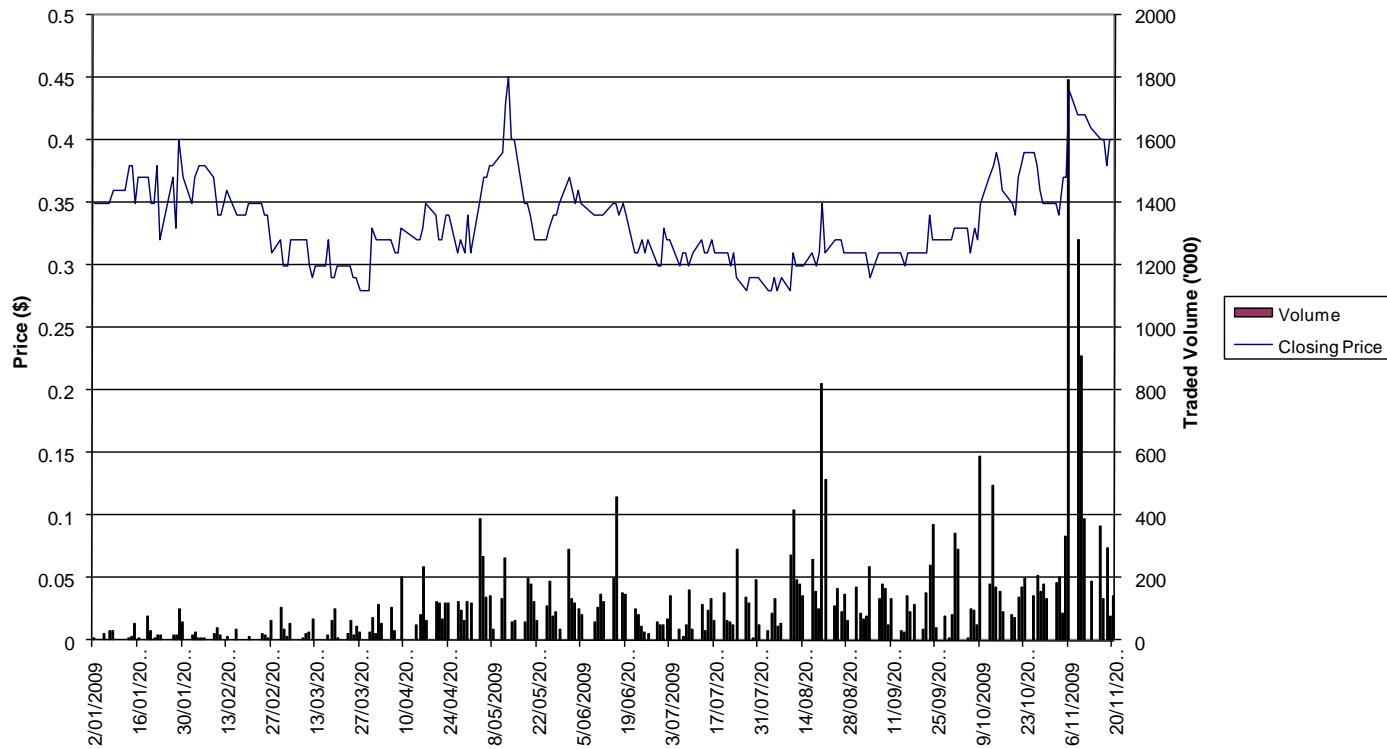
- > Awarded Geothermal Drilling Program grant for \$7 million and **recently a Renewable Energy Demonstration Program grant for \$63 million**
- > JV Funding: up to \$87 million plus equity share of project costs

## Joint Venture Partners and Alliances

- > Paralana
  - > Beach Petroleum (up to 36 per cent for \$30m)
  - > TRUenergy (up to 30 per cent for \$57m)
- > Spain and Canary Islands
  - > Advanced discussions with several parties
  - > Cooperative agreement with Spanish Federal and Madrid Regional governments
- > China
  - > Conventional and Engineered Geothermal Systems
  - > Exclusive government supported exploration agreement

# Petratherm share price

PTR Share Price and Volume 2009



Share price steady and improving despite an uncertain market. Trading volume has increased significantly.

# Board of Directors



Derek Carter  
Chairman



Simon O'Loughlin  
Director



Richard Hillis  
Director



Richard Bonython  
Director



Terry Kallis  
Managing Director



Don Stephens  
Secretary

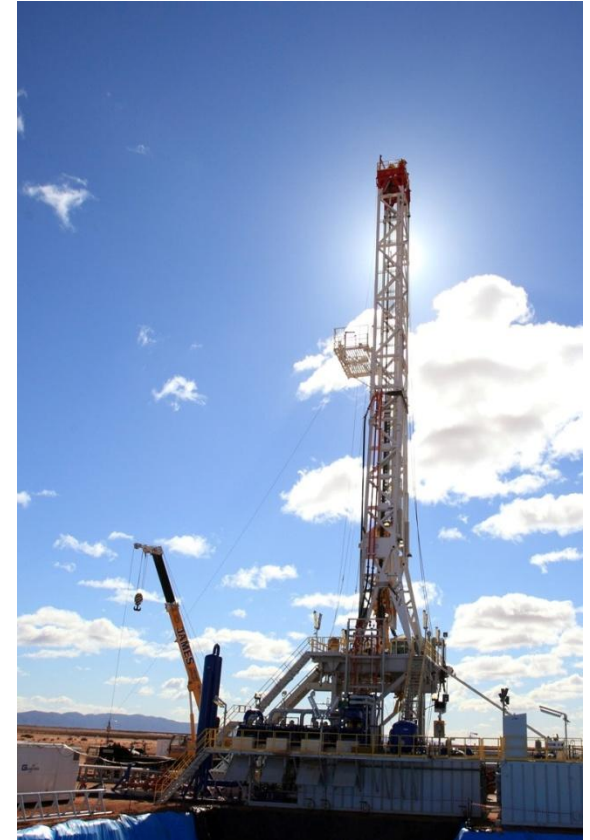
**An experienced board with a strong combination of commercial and technical skills**

- > Financial management
- > Legal
- > Marketing
- > Project Management
- > Corporate Governance
- > Exploration and development
- > Geology and Geophysics
- > Resources and Energy
- > Government and Stakeholder relations

# Our business model

***"To explore for and develop emission free geothermal energy projects that are commercially sustainable"***

- > To develop a portfolio of quality geothermal energy projects
- > Explore both conventional and engineered geothermal systems – for power and heat
- > Find a favorable combination of geology and market conditions - *"shallow hot rocks close to market"*
- > Introduce joint venture partners with the right skills, risk appetite and funding ability



## Recent achievements

- > Emerged from a challenging financial year in a strong position
- > Drilling commenced with Ministerial Launch and has now reached target depth of 4012 metres
- > TRUenergy signs as a joint venture partner
- > Paralana JV is awarded a \$7 million geothermal drilling grant



## Recent achievements

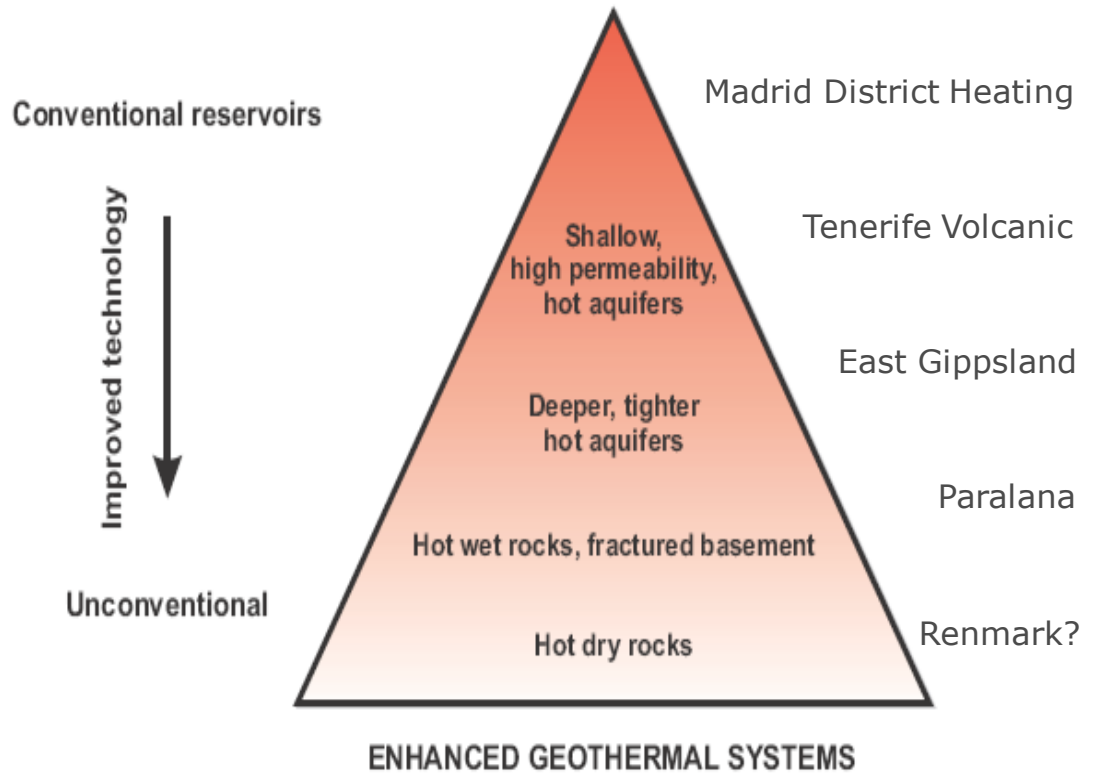
- > Paralana awarded \$62.8 million Renewable Energy Demonstration Program Grant
- > \$7.3 million raised in placement and Share Purchase Plan
- > Cooperative Agreement with Spanish Governments on the Geo-Madrid project
- > Exploration/assessments continue in Spain, China and Victoria



# Geothermal energy technologies and cost drivers

## Cost Drivers

- > Temperature
- > Drilling Depth
- > Flow Rate
- > Network Connection
- > Generation Plant
- > **High upfront costs – drilling, fracture stimulation, connection, plant**
- > **Project economics are geology and location specific**



# Renewable energy policy and geothermal

## Strong Federal and State Government support

- > \$50 million geothermal drilling program with a maximum \$7 million per project
- > \$300 million Renewable Energy Demonstration Program
- > Review of electricity and gas networks by the Australian Energy Market Commission (AEMC)
- > Emissions Trading Scheme (CPRS)
- > Renewable Energy Target of 45,000 GWh by 2020
- > An increase in the after tax REC penalty price from \$40/MWh to \$65/MWh and extending to 2030 improves revenue significantly

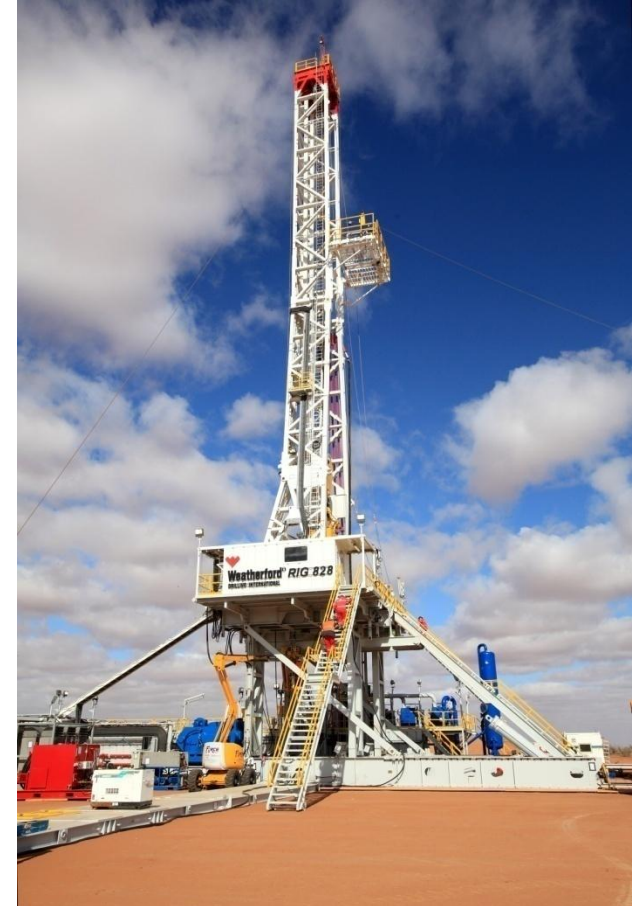
## Strong industry networks

- > Geothermal energy industry development framework
- > Australian Geothermal Energy Association (AGEA)
- > Australian Geothermal Energy Group (AGEG)



# Our Australian projects

- > Paralana project
  - > 2000 HP drilling rig brought into Australia by Petratherm and our JV partners - now available to geothermal industry enabling other projects
  - > Drilling of Paralana 2 well reached target depth of 4012 metres at our site 600km north of Adelaide
  - > Temperature measurements to be taken 4 weeks after casing completed
- > East Gippsland in Victoria
  - > Awarded a 9,000km<sup>2</sup> geothermal exploration permit to develop a Hot Sedimentary Aquifer
- > Renmark in South Australia
  - > Two geothermal exploration licenses (GELs), located 26 km northwest of Renmark in the Riverland region
  - > Close to two major transmission lines capable of carrying in excess of 220 MW of power



# Paralana geothermal energy JV project - snapshot



Our Paralana project 600km north of Adelaide in South Australia

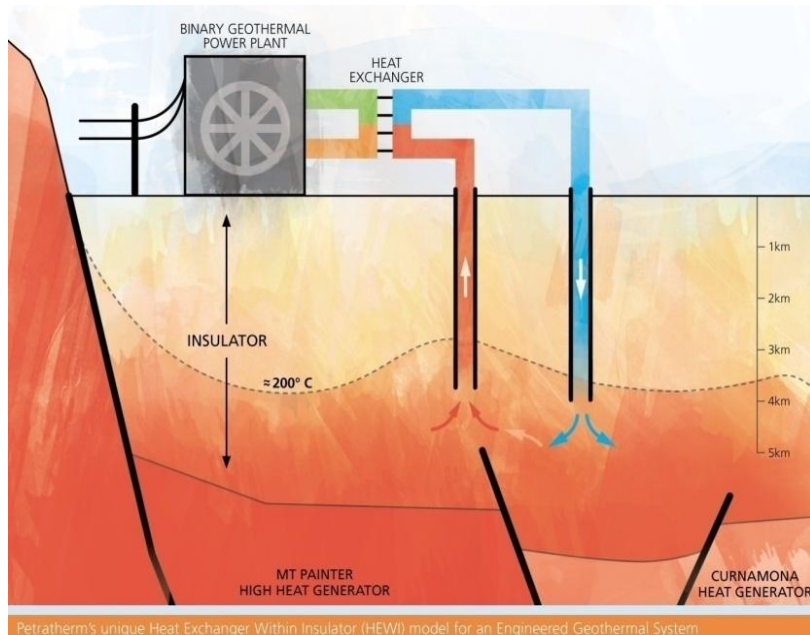
- > Anecdotal evidence from the Paralana hot springs in the nearby Flinders ranges
- > High heat flow - 128 mW/m<sup>2</sup>
- > Measured temperature of 109°C at 1807m
- > Mature basin, stable formations, no hydrocarbons
- > Inferred geothermal resource of 230,000 PJ – independent assessment by competent person - HDRPL
- > Customer for initial 3.75MW plant at nearby Beverley Mine
- > Potential commercial viability at all stages - scale up plan to 30MW and beyond

# Paralana 2 well drilling – key success factors

- > The well was terminated at a depth of 4,012m, took longer and cost more than originally planned
- > Key success factors developed to guide Paralana project and incorporated in JV decision-making, GDP grant contract and REDP grant application
- > Key success factors for the Paralana 2 well are:
  - > Equal/better industry safety & environment benchmarks ✓
  - > Target a minimum drill depth of 3600m ✓ and maximum drill depth of 4000m ✓
  - > Achieve a minimum temperature of 170°C at 4000m – *expect to meet/exceed (measured in 4 weeks after casing)*
  - > Formation evaluation and selection of zones for stimulation – permeability/in situ stress field - *observed inflows to well commencing at 3690m (to be assessed)*



# Paralana project – HEWI model and economic assumptions



Heat exchanger created in the porous insulating layer above the granite heat source. Expected to reduce risk, cost, time

(\*Long Run Marginal Cost calculation over 20 years, includes all costs, consistent with energy industry comparisons made by the Electricity Supply Association of Australia, McLennan, Magasanik and Associates and the AGEA Economics Committee)

## Key Economic Assumptions

- > Temp. of 170°C to 200°C at 3,600m to 4,000m
- > Flow rate of 75 litres per sec – conservative compared with other public announcements
- > Net output per production well of 3.75 MW based on flow and inclusive of parasitic loads
- > 20-year project life, includes costs of 12 wells for a 30 MW development and customer connection
- > Results in a LRMC\* of \$107/MWh (delivered), comparable with independently assessed industry LRMC ranges
- > Bundled price for sale of output black and RECs expected to be > \$140/MWh due to current high off grid price at Beverley mine
- > JV retains the full value of black and RECs – no predetermined price – retain full upside
- > Potential for commercial viability at small scale 3.75 MW, 7.5 MW and 30 MW

# Paralana joint venture arrangements

- > Beach Petroleum Farm-in (Jan 2007) for up to \$30M for 36%
  - > \$5M first well and stimulation
  - > \$5M second well and stimulation – earns 21 %
  - > After HEWI – Option to earn a further 15% for \$20M
  - > Plus equity share of project costs at every stage
  
- > TRUenergy Farm-in (Aug 2008) for up to \$57M for 30%
  - > \$3M first well and stimulation
  - > \$3M second well and stimulation – earns 10%
  - > After HEWI – Option to earn a further 5% for \$7M
  - > After 7.5 MW pilot plant – Option to earn a further 15% for \$44M
  - > Plus equity share of project costs at every stage



## **Under the Paralana Joint Venture post HEWI and with REDP**

For a \$200m, 30 MW demonstration project with JV options taken up –  
Petratherm would require minimal investment - retains 34% of project and resource

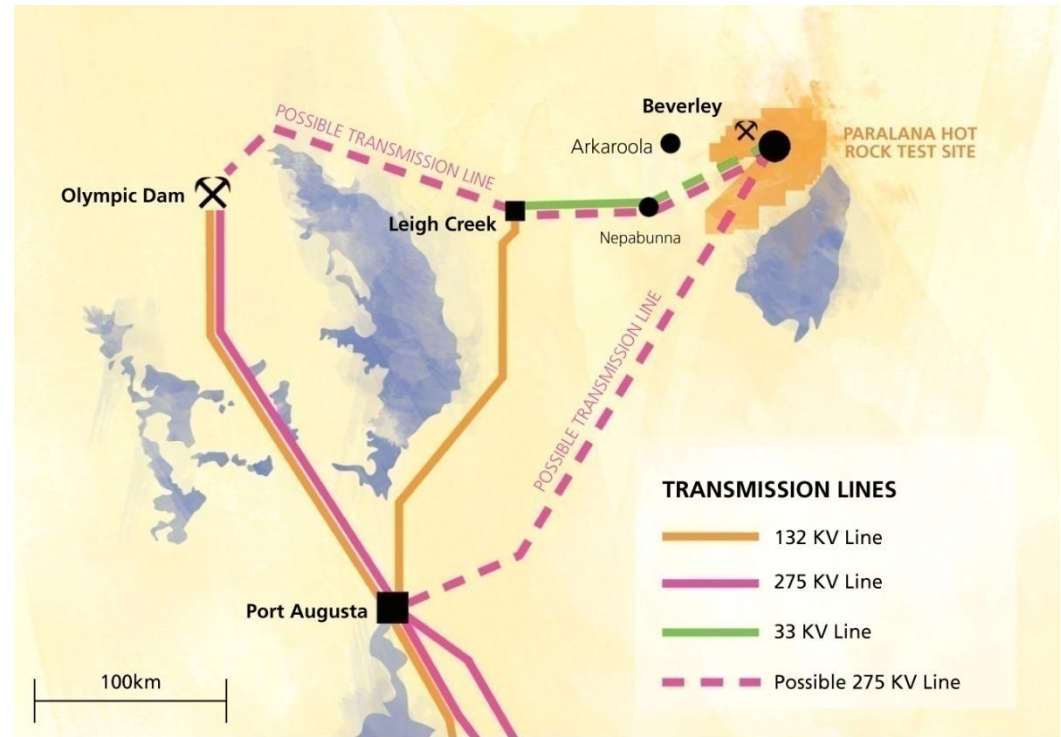
# Joint Venture Contributions post HEWI (assumes earn-in options exercised)

Project costs to 2014 for 30 MW project – almost free carry

<b>With REDP – Base Case Cost Assumption</b>	<b>Forecast Capital Cost (\$m)</b>	<b>Beach Contribution (\$m)</b>	<b>TRU Contribution (\$m)</b>	<b>PTR Contribution (\$m)</b>
7.5 MW (1 well plus plant plus transmission)	\$45m	\$25.4m	\$9.3m	\$0.4m
30 MW (9 wells plus additional plant)	\$155m	\$37.1m	\$65.9m	\$0.0m
<b>Total without REDP</b>	<b>\$200m</b>	<b>\$62.5m</b>	<b>\$75.2m</b>	<b>\$0.4m (0.2%)</b>
<b>With REDP – 20% Cost Increase</b>				
7.5 MW (1 well plus plant plus transmission)	\$54m	\$28.6m	\$10.6m	\$4.8m
30 MW (9 wells plus additional plant)	\$186m	\$48.2m	\$84.2m	\$1.6m
<b>Total with REDP</b>	<b>\$240m</b>	<b>\$76.9m</b>	<b>\$94.8m</b>	<b>\$6.3m (2.6%)</b>

# Paralana transmission plan

- > Close to customer at the Beverley mine – only 10 kilometres away
- > Plans for mine expansions - Four Mile deposit and new areas under exploration
- > Longer term plan to supply large-scale base load power through entry points at Port Augusta and Olympic Dam
- > Potentially from plants of 260MW to 520MW capacity and two high voltage transmission lines
- > Consistent with industry network solution and the Australian Energy Market Commission's recent proposal for changes to the National Electricity Rules – to facilitate renewable energy



The proposed Paralana transmission plan

# Industry transmission plan – northern SA

- > 2009 independent report by McLennan Magasanik & Associates (MMA) shows savings in linking geothermal projects in the northern part of South Australia early to the National Electricity Market (NEM)
- > MMA estimates benefits of \$860 million for South Australian customers and \$2.8 billion for customers across the Australian market
- > Geothermal energy to displace higher cost forms of renewable energy
- > Potentially the first 'SENE' – *scale efficient network extension* - efficient connection of clusters of generation to be proposed by AEMC

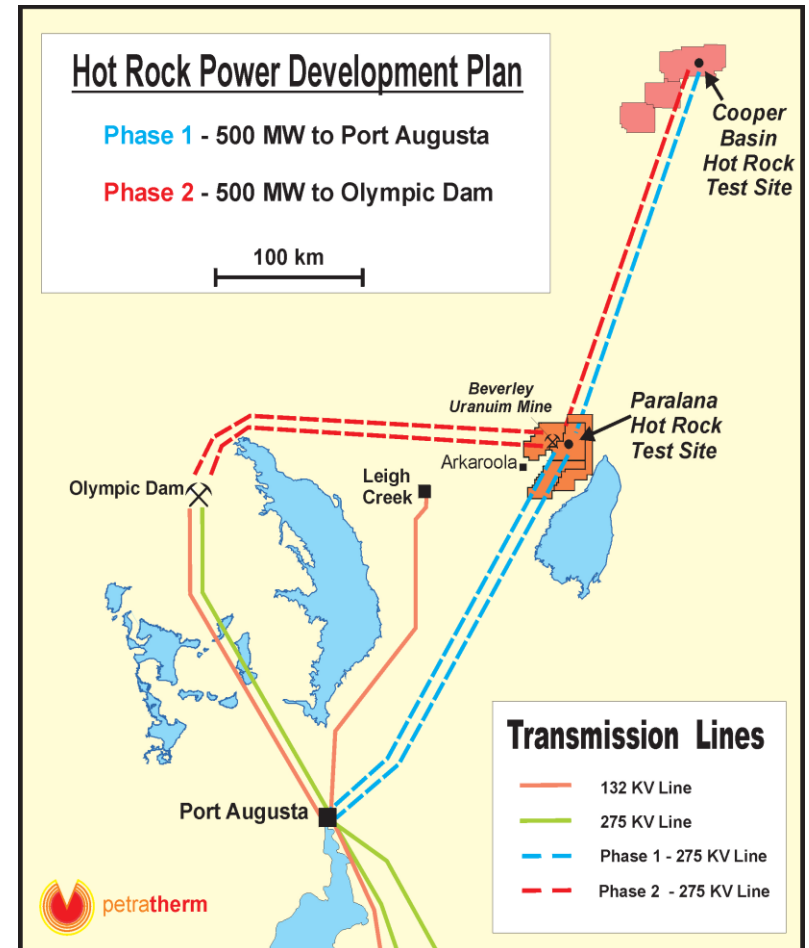


Table 2-1 Potential Geothermal Development in the north region of South Australia





Financial Year ending June	Geodynamics (Innamincka) Net sent-out capacity	Petratherm (Paralana) Net sent-out capacity
2011	0	7.125
2012	0	7.125
2013	50	7.125
2014	50	28.5
2015	100	57
2016	150	85.5
2017	250	114
2018	400	152
2019	550	190
2020	550	228
2021	550	266
Capacity Factor	95%	95%
Ultimate Capital Cost (\$M)	\$2,750	\$1,300
Transmission Cost <sup>2</sup> (\$M)	\$553	\$164
Generation LRMC (\$/MWh)	\$68	\$72
Transmission Cost (\$/MWhso)	\$10	\$7
Loss to Olympic Dam	15%	5%
LRMC to OD (\$/MWh)	\$91	\$83

Note that capital and operating costs were confidential and an indicative range is shown in this report.

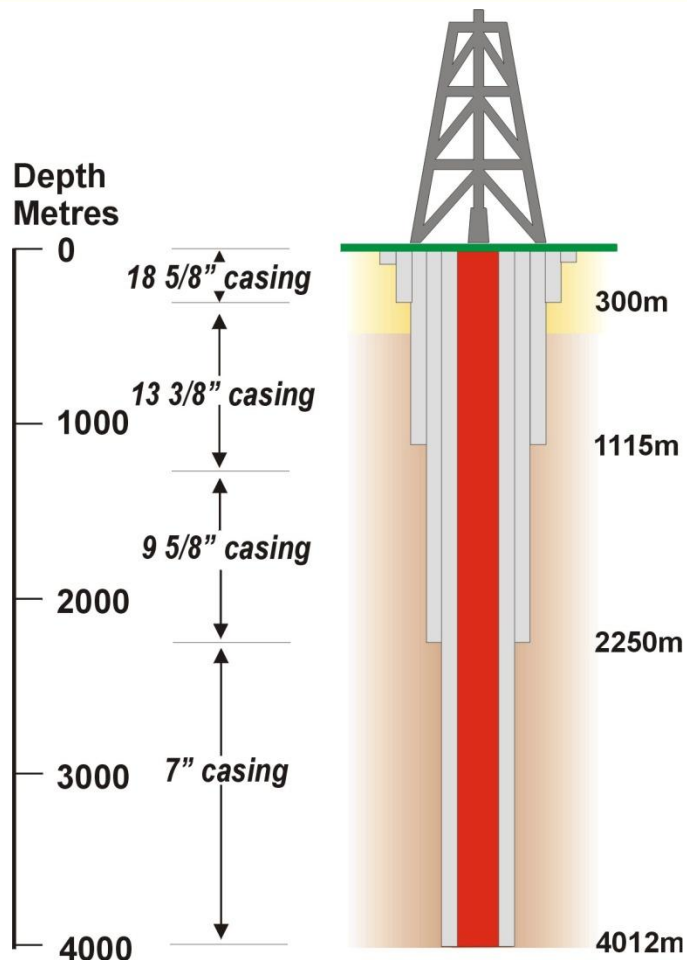
- > Paralana delivered price after paying for electricity transmission is estimated by MMA to be \$83/MWh to Olympic Dam

Table shows long-term development path for PTR with MMA assuming a 9.3% and 7.8% real discount rate for plant and transmission respectively.

Transmission stages:

-  2013/14 with double circuit Paralana to OD
-  2014/15 with double circuit Innamincka to Paralana
-  2014/15 with one extra circuit Davenport to Olympic Dam
-  2017/18 with third circuit Paralana to Olympic Dam

# Paralana 2 - Drilling Completed to 4012 m



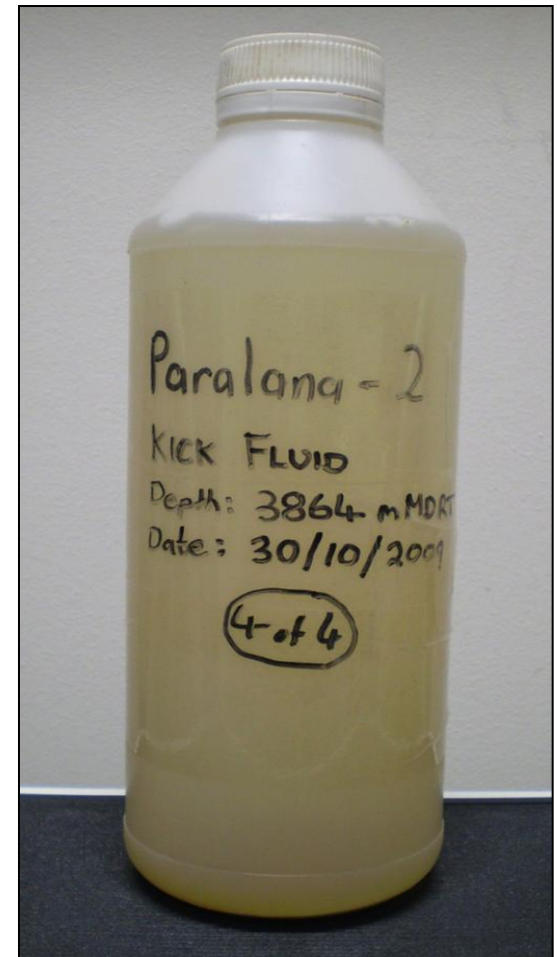
- > First well designed following low-risk, standard operating methods
- > Steady but slow drilling due to hard formations
- > Conservatively drilled to maximize likelihood of success
- > Wire-line and LWD logging undertaken to 3740 metres
- > Forward plan to finish well by late Dec. 2009
- > Temperature measurements to be undertaken in 4 weeks after casing
- > Inflow zones encountered from 3690m

# Paralana 2 – Geothermal reservoir geothermal brines

- Inflow zones from 3690m
- Brine fluid recovered at surface and being tested
- Wire-line and LWD Program to 3740 metres

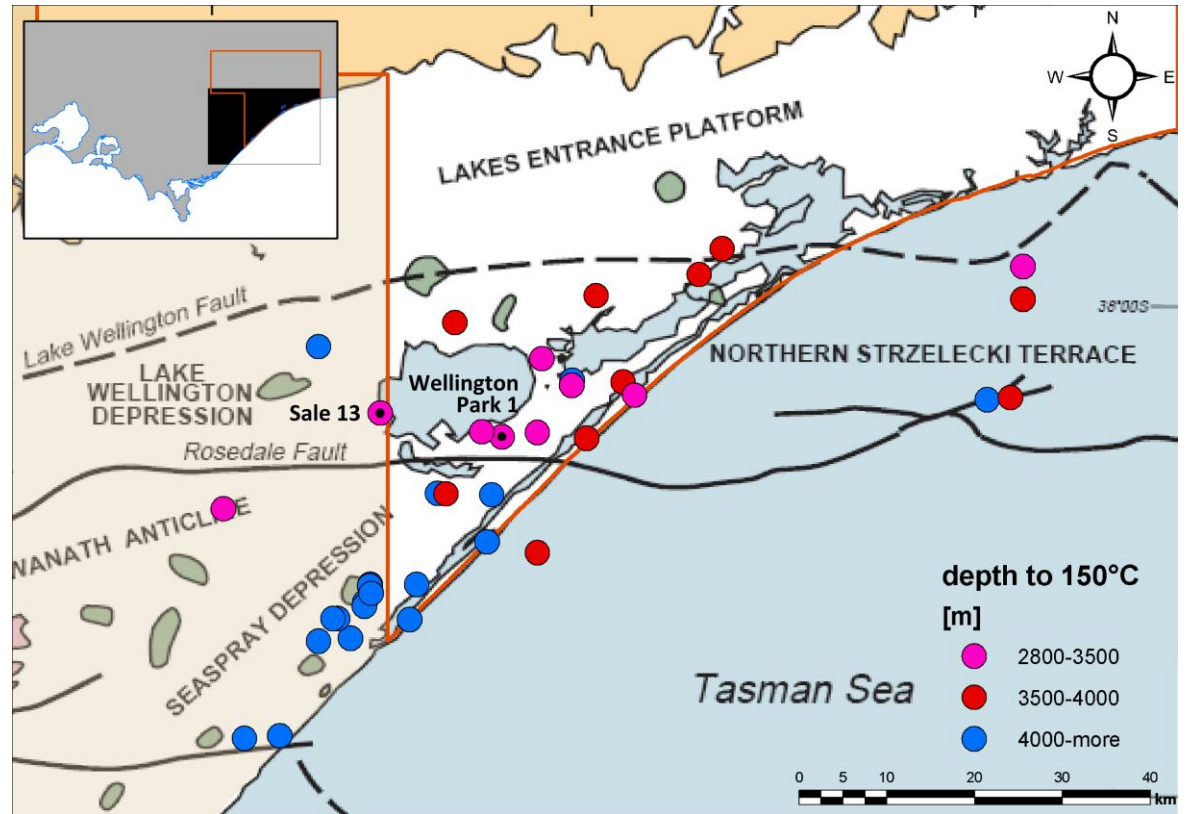
## Reservoir Characterisation

- > Temperature
- > Permeability
- > In-situ stress field
- > Geology
- > Rock Properties



# Australia - East Gippsland, Victoria

- > Petratherm has a 9,000km<sup>2</sup> geothermal exploration permit for the East Gippsland Basin in Victoria
- > Hot Sedimentary Aquifer Project
- > Favorable transmission connection options to the National Electricity Market
- > Expect fluid in excess of 150°C at economically viable drill depths (3.5–4.0 kms)



Our East Gippsland project east of Melbourne in Victoria

# Spain

## Madrid

- > Madrid District Geothermal Heating Project
- > Signed cooperative agreement with Spanish Federal and Madrid Regional governments

## Barcelona

- > Have four geothermal investigation permits – both engineered geothermal and district heating potential

## Canary Islands/Tenerife

- > Magneto-telluric survey of volcanic island
- > Advanced joint venture discussions

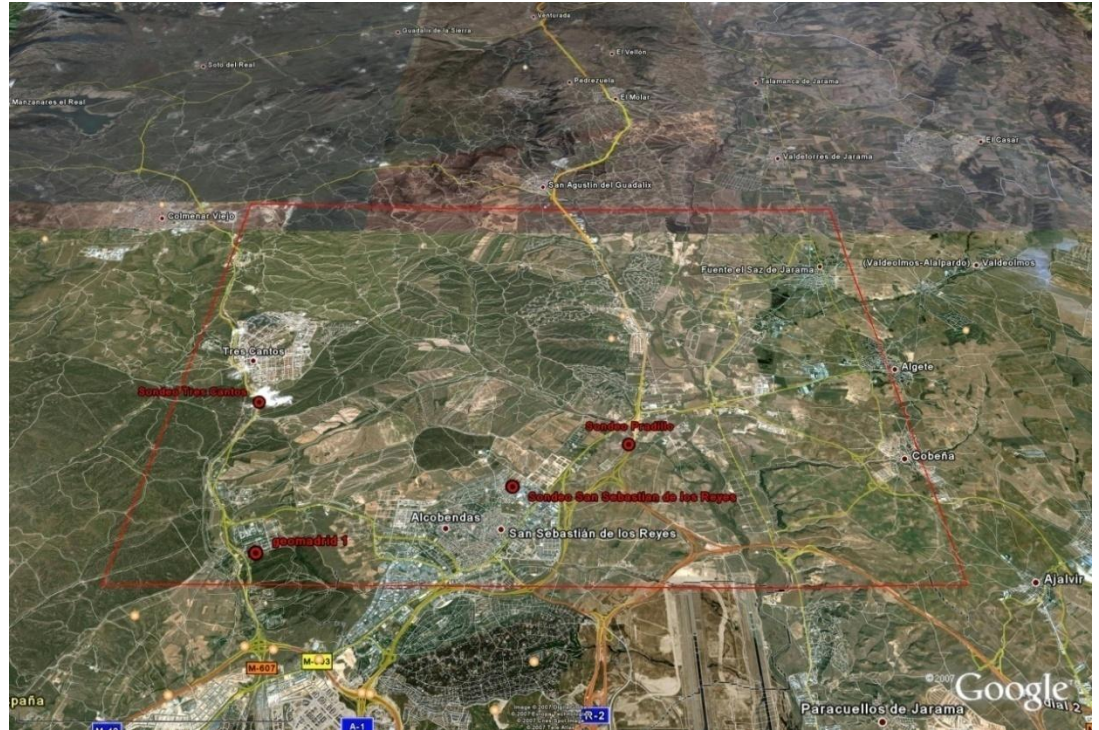


Madrid – home to our promising district geothermal heating project

# Spain – Madrid district heating project

*“Highlighted as one of six renewable energy projects of interest within the Madrid Regional Government’s Renewable Energy Cluster”*

- Large tenement 20km by 20km in the north of Madrid
- Three shallow 2000m wells drilled
- One deep 3.4km well drilled with 156°C
- Study indicates producing 8MW with annual production in excess of 45,000MWh (thermal)
- Cooperative agreement between Spanish Federal and Madrid Regional Government



Madrid tenement area – 25 km north of the city

# Spain - Barcelona

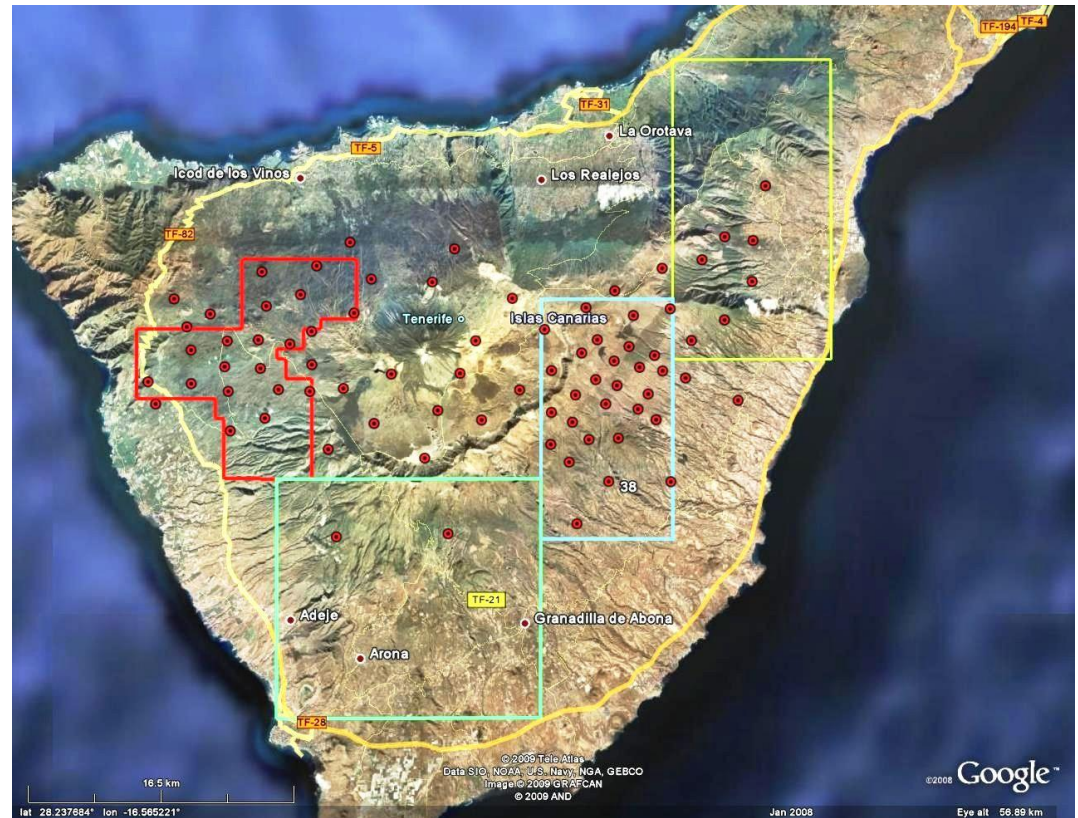


Barcelona – Petratherm has four investigation permits 30kms north-north east of the city

- > Petratherm has four geothermal investigation permits covering areas within the Valles and Ebro Basins near the city of Barcelona
- > Close to major electricity transmission infrastructure
- > The geology and market characteristics make the area attractive for geothermal district heating and engineered geothermal systems

# Spain - Tenerife

- > Active volcanic island with a population of one million
- > Studies suggest magma chamber 3km to 4km below surface - temperatures potentially, 250°C to 300°C
- > Targeting 50MW to 100MW development
- > Energy prices are over €90/MWh or AUD \$150/MWh - three times prices in Australia
- > Commenced extensive magneto-telluric survey work to pinpoint best well site
- > Advanced joint venture discussions to develop Tenerife project



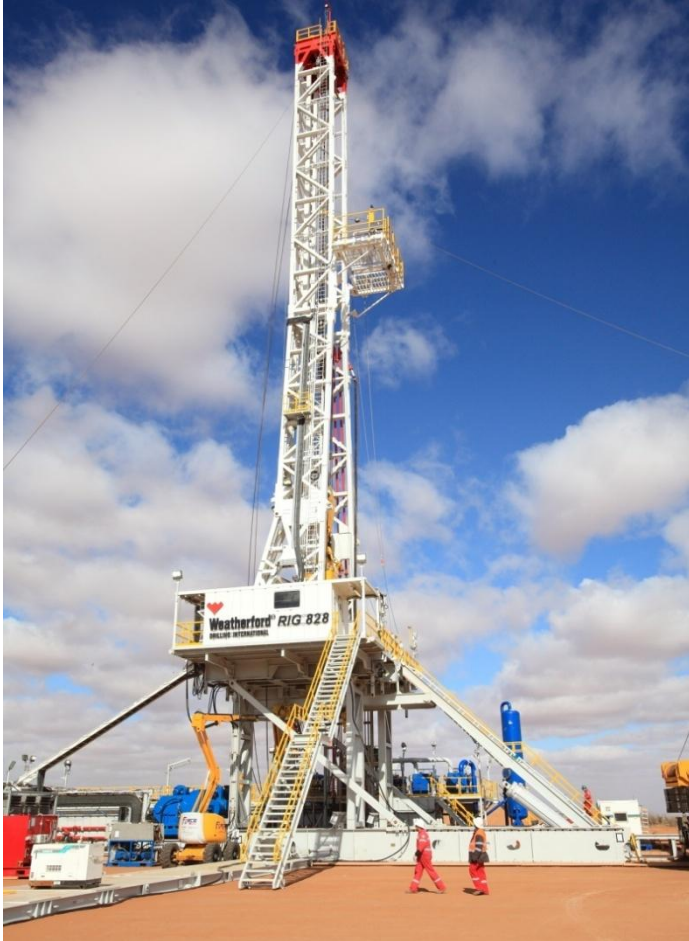
Tenerife MT survey stations

# China

- > Exclusive Cooperative Agreement to identify high prospect geothermal energy projects in China with:
  - > Chinese Geothermal Energy Society
  - > Geological Survey of China
  - > Chinese Academy of Sciences
  - > China Institute of Geo-Environment Monitoring
- > Two areas in South East China identified for potential future development
  - > Jiangsu Province and Subei Basin
- > Targeting Hot Sedimentary Aquifer contained in permeable Limestone at 4km to 5km depth
- > Petratherm recently hosted a Chinese delegation
  - > met with PIRSA and South Australian Mineral Resources Development Minister Paul Holloway
  - > visited Paralana and Innamincka in South Australia



# Outlook for 2010 and beyond



## Paralana Joint Venture Project

- Plan to run cement plugs as required, redrill, condition hole, complete logging, case and cement – finish late Dec. 2009
- Temperature measurement 4 weeks after casing and cementing
- 1<sup>st</sup> Qtr 2010: Mini fracture program/fracture stimulation design
- 2<sup>nd</sup> Qtr 2010: Multi-zone fracture stimulation
- 3<sup>rd</sup> Qtr 2010: drilling of the Paralana 3 deep producer well
- End 2010: Circulation Test – Proof of Concept
- 2011: Commission first stage 3.75 MW power plant

# Outlook for 2010 and beyond



## Paralana launch:

SA Premier Mike Rann and Federal Resources Minister Martin Ferguson with the Joint Venture partners

- > Complete Tenerife MT survey and progress JV negotiations – identify deep drill target in Q1 2010, develop work program
- > Continue Madrid GDH coordination with Federal & State Governments and progress JV opportunities complete Q1 2010
- > Other projects – Barcelona GDH/EGS and Madrid EGS
- > China exploration strategy and JV opportunities

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**BLUE SKY**  
**FUTURE**

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