petratherm

Annual General Meeting 2007

Petratherm Business and Projects Overview

Presented by:
Terry Kallis,
Managing Director
Petratherm Limited

Hilton Hotel Adelaide, 29 November 2007

Explorer and Developer of Geothermal Energy

Presentation Outline

- Key Messages
- Corporate Overview
- Climate Change and Renewable Energy
- EGS & Geothermal Energy Project Economics
- Petratherm's Market Differentiation - Exploration and HEWI Models
- Australian Projects – Paralana JV Project
- International Projects - Spain & China
- Key Challenges for EGS Projects
- Increasing Shareholder Value
- Summary

Key Messages

- Petratherm's key strength lies in its approach to "exploration for heat" and its commercial assessment of projects - "location, location, location".

- The approach has resulted in a portfolio of quality projects in Australia and Overseas – first mover in Spain for "Hot Rocks".

- Petratherm's unique HEWI model has the potential to concurrently and substantially reduce costs and risks – also reducing the time for delivery

- Petratherm has, in its Paralana Project, clear commercial and competitive advantages with a willing potential customer at "off grid" prices and a realistic long term commercialization path – *unique path to commercialization*

- Petratherm's business focus is to increase shareholder value through a clear combination of strategies that reduce cost, reduce risk and optimize revenue

petratherm

Corporate Overview

- Established in 2003 and listed on the ASX in July 2004
- Major shareholder is Minotaur Exploration – 34%
- Around 2600 shareholders
- Shares on Issue - 57,850,000 – Current Price of $ 0.89
- Market Capitalization of $ 51.5 million
- $7.5 M in cash as at end Sept. 2007, $5M grant and up to $ 30 M JV with Beach Petroleum
- Mission – "*to explore and develop, emission free, geothermal energy projects that are commercially sustainable*"
- Strategy – "*shallow hot rocks close to market*" – deeply buried granites (5-6 kms) with good insulating cover (2-3 kms)

petratherm

petratherm

Board & Management

Derek Carter
Chairman

Simon O'loughlin
Director

Prof. Richard Hillis
Director

Dr Lloyd Taylor
Director

Richard Bonython
Director

Terry Kallis
Managing Director

Donald Stephens
Company Secretary

Peter Reid
Operations Manager

Corporate Overview

- Portfolio of Quality Projects – four in Australia, five in Spain, China under examination – portfolio under expansion – expect 7 to 8 projects in Spain

- Projects include Engineered Geothermal Systems (EGS) and Conventional Projects – products include electricity and direct use heat

- Combined skills and experience of the Board, Management, Partners and Consultants capable of delivering successful geothermal energy projects – from underground resource through to market

- Focus on continually increasing Shareholder Value through a combination of cost reduction, risk reduction and revenue optimization

petratherm

Petratherm - 2006/2007 Key Achievements

- Discovery of world-class heat resource at Paralana, South Australia.
- MOU with Heathgate Resources to provide their Beverley Uranium Mine with electricity to meet their growing needs.
- Federal Government approval and exclusive Agreement to investigate China's Hot Rock potential through Asia Pacific Partnership on Climate and Clean Development (AP6)
- Up to $30 million Joint Venture with Beach Petroleum to test and build Phase-1 commercial plant at the Paralana Hot Rock Resource ($10 M for 21% equity and option for additional 15% equity for a further $20 M)
- $5 million Federal Government grant to support development of a new lower risk heat extraction process (HEWI Model)
- New Spanish Hot Rock Projects announced near Madrid & Barcelona - Conventional Geothermal in Tenerife, Canary Islands

Photo: Callabonna Project Area, South Australia

petratherm

Climate Change and Renewable Energy

- Stern report – “Economics of Climate Change”
- Al Gore’s documentary - “An Inconvenient Truth”
- Renewed emphasis – Globally and Nationally
- Australia – Major policy shift in the past year
- IPCC Synthesis Report - very strong messages
- New Labor Federal Government – “Clean Energy Plan”

petratherm

Renewable Energy Policy & Geothermal

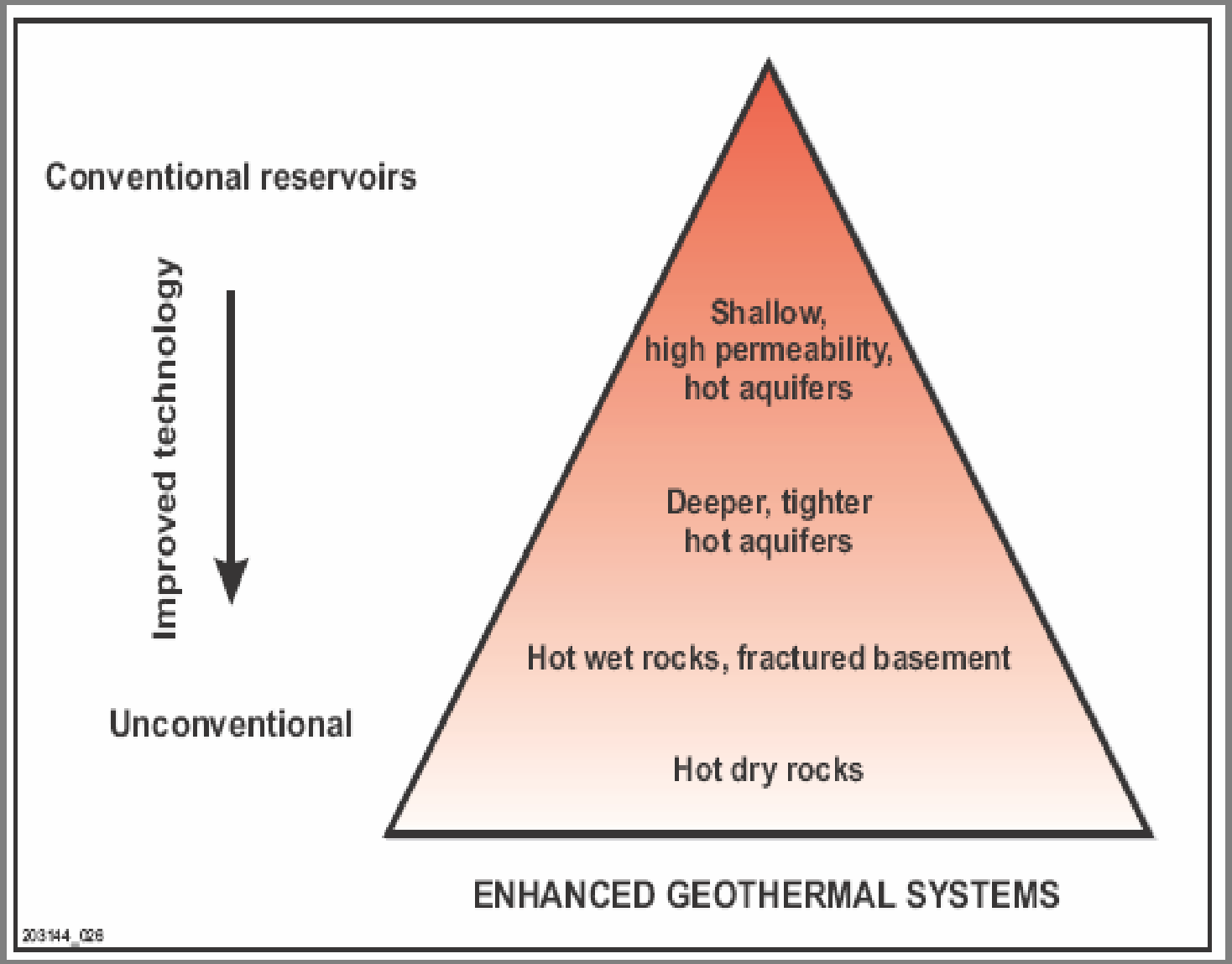
- Federal Labor Government Clean Energy Plan to ratify Kyoto, Emissions Trading by 2010, 20% Renewable Energy target by 2020, $500 M Renewable Energy Fund ($50 M drilling initiative fund - 5 projects, demonstration project funding) & $150 M Energy Innovation Fund

- The Australian Geothermal Energy Group (AGEG), developers/companies, academic/research institutions and government departments federal/state – collaborative work

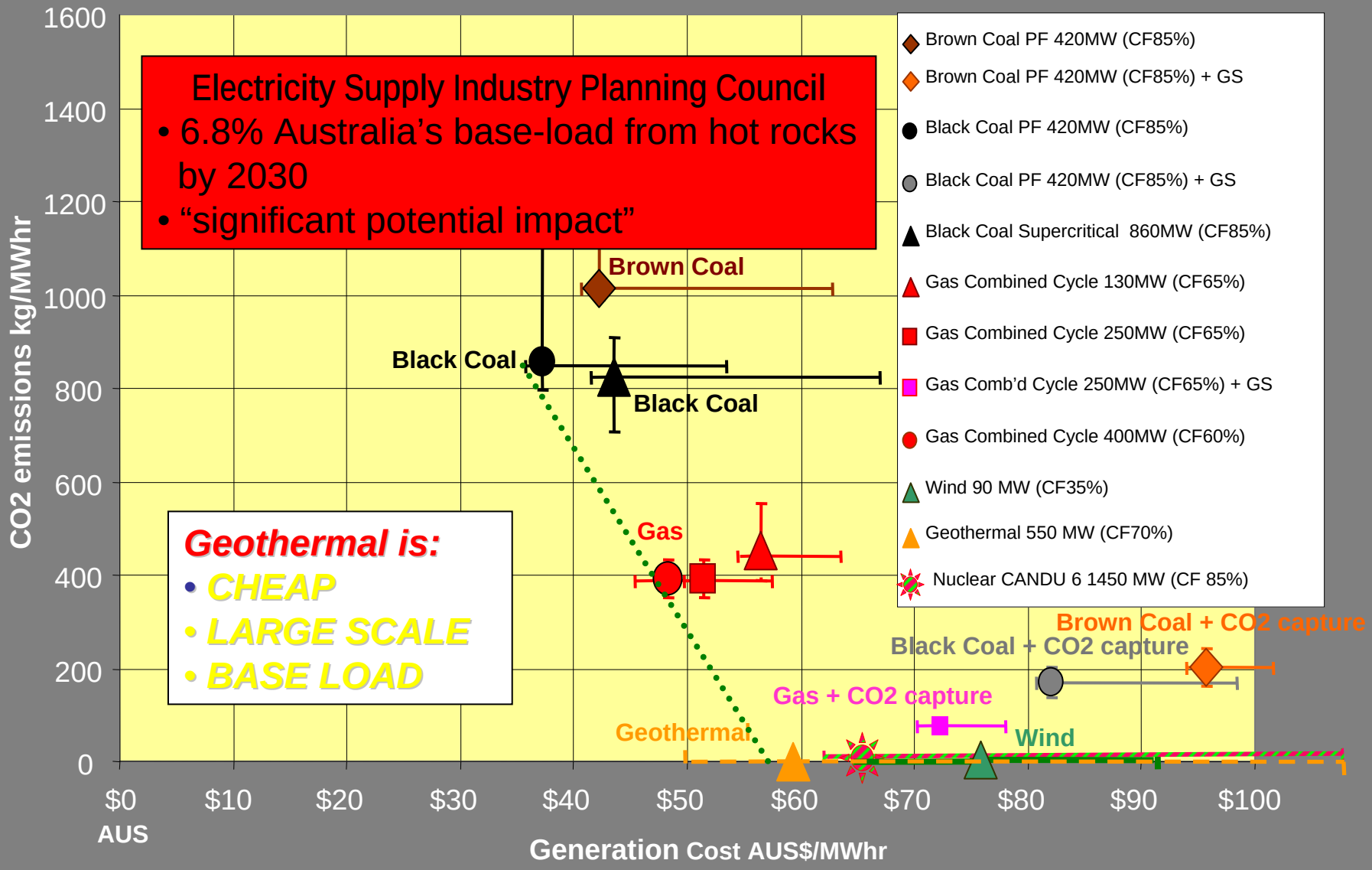
- The Australian Geothermal Energy Association (AGEA) – developers/companies and service companies – Policy and Advocacy notably to governments.

- The Australian Geothermal Energy Industry Development Framework – Federal initiative aims to grow the Industry

Engineered or Enhanced Geothermal Systems



Geothermal Energy Cost Comparison



COMBUSTION CO2 EMISSIONS vs LONG RUN COST

(Source: PIRSA Compilation of ESIPC data 2006-07)

Geothermal Energy Project Economics

- Temperature (differential, quality and type of resource)
- Drilling Costs (depth, size, geological formation, availability)
- Energy Flow Rates (volume, pressure, energy transfer)
- Plant Capital Costs and related efficiencies
- Connection and Access to markets
- Operating Costs
- Economies of Scale/Production
- Revenue/Product Pricing in a Competitive Market
- Regulatory Regime – carbon pricing

- Critical Project Parameters are Revenue, Capital Costs (drilling, plant, connection) and Thermal Resource (temperature differential, volume and flow)

petratherm

Petratherm's Exploration Model

"Shallow Hot Rocks close to Market"

"Hot Rocks" are EGS , i.e. Engineered Geothermal Systems

Prime Cost Drivers

- Temperature Differential
- Drilling Depth
- Flow Rate
- Network Connection
- Generation Plant

Petratherm is seeking to optimize the key drivers to achieve the lowest long run average cost electricity delivered while minimizing project risks.

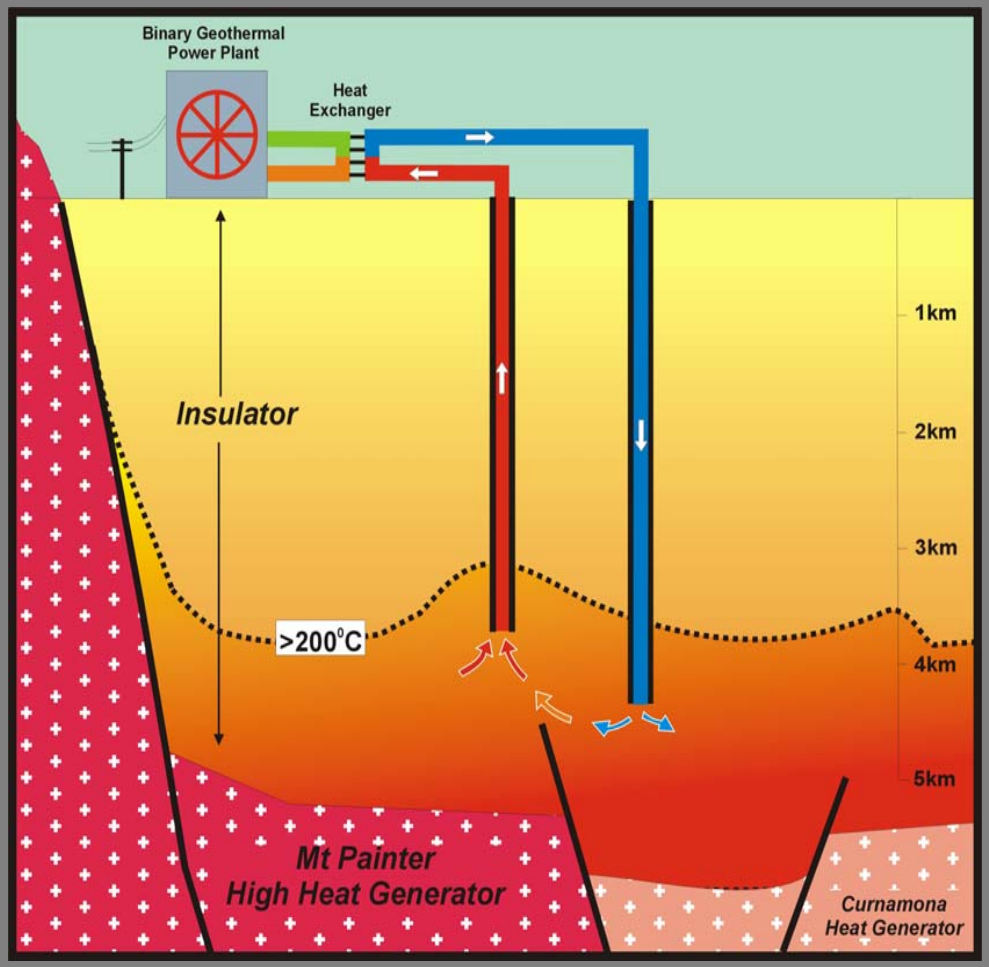
petratherm

Heat Exchanger Within Insulator (HEWI) Model

EGS - engineered geothermal system i.e. underground heat exchanger

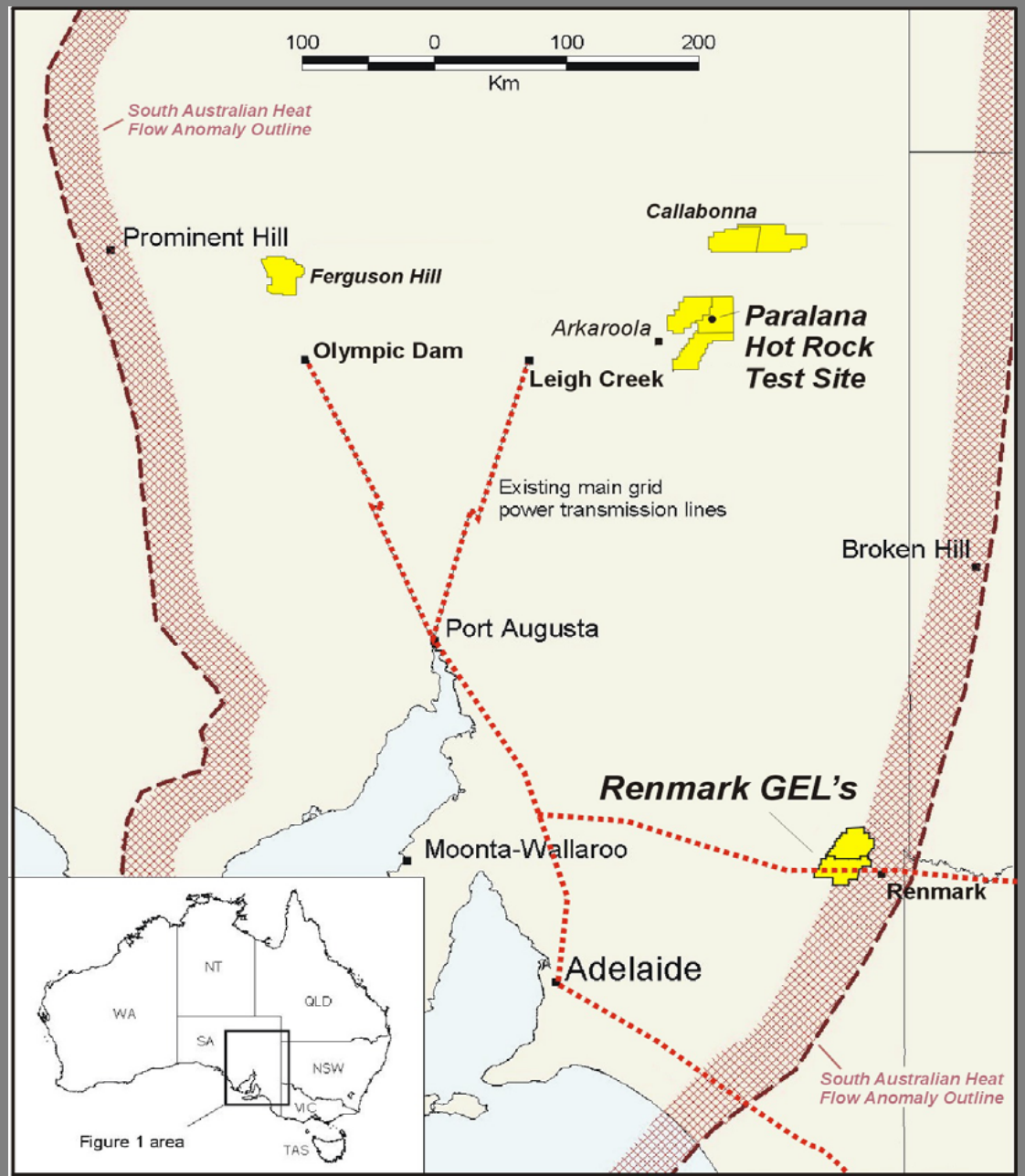
- Higher Permeability
- Chemically Stable
- No Potential Radon build up
- Lower Risk

= Cheaper Power!

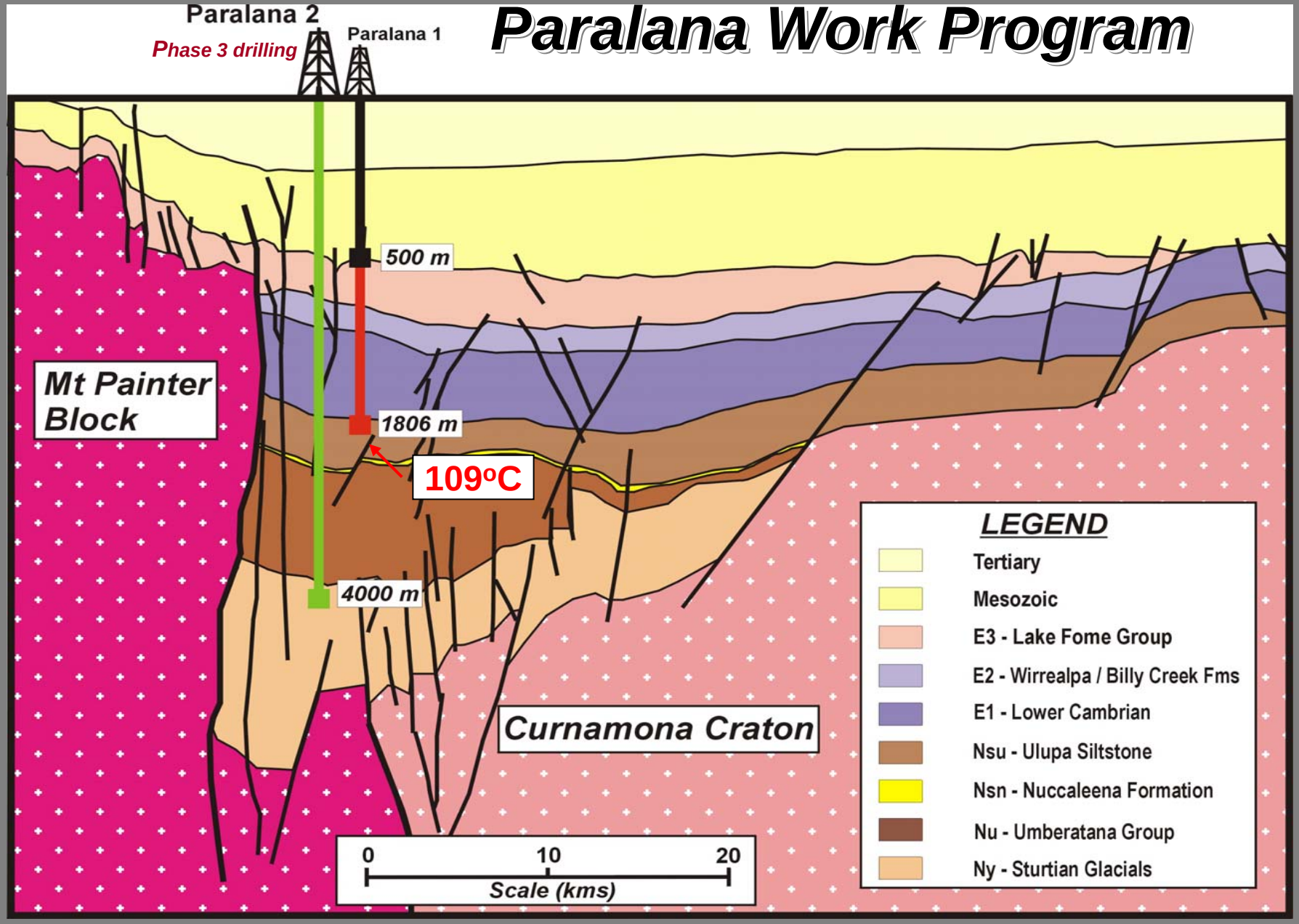


petratherm

Petratherm's SA Projects



Paralana Work Program



petratherm

Temperature measurements indicate 200 degrees C at 3.6km

Paralana Geothermal Energy JV Project

Paralana Key Features

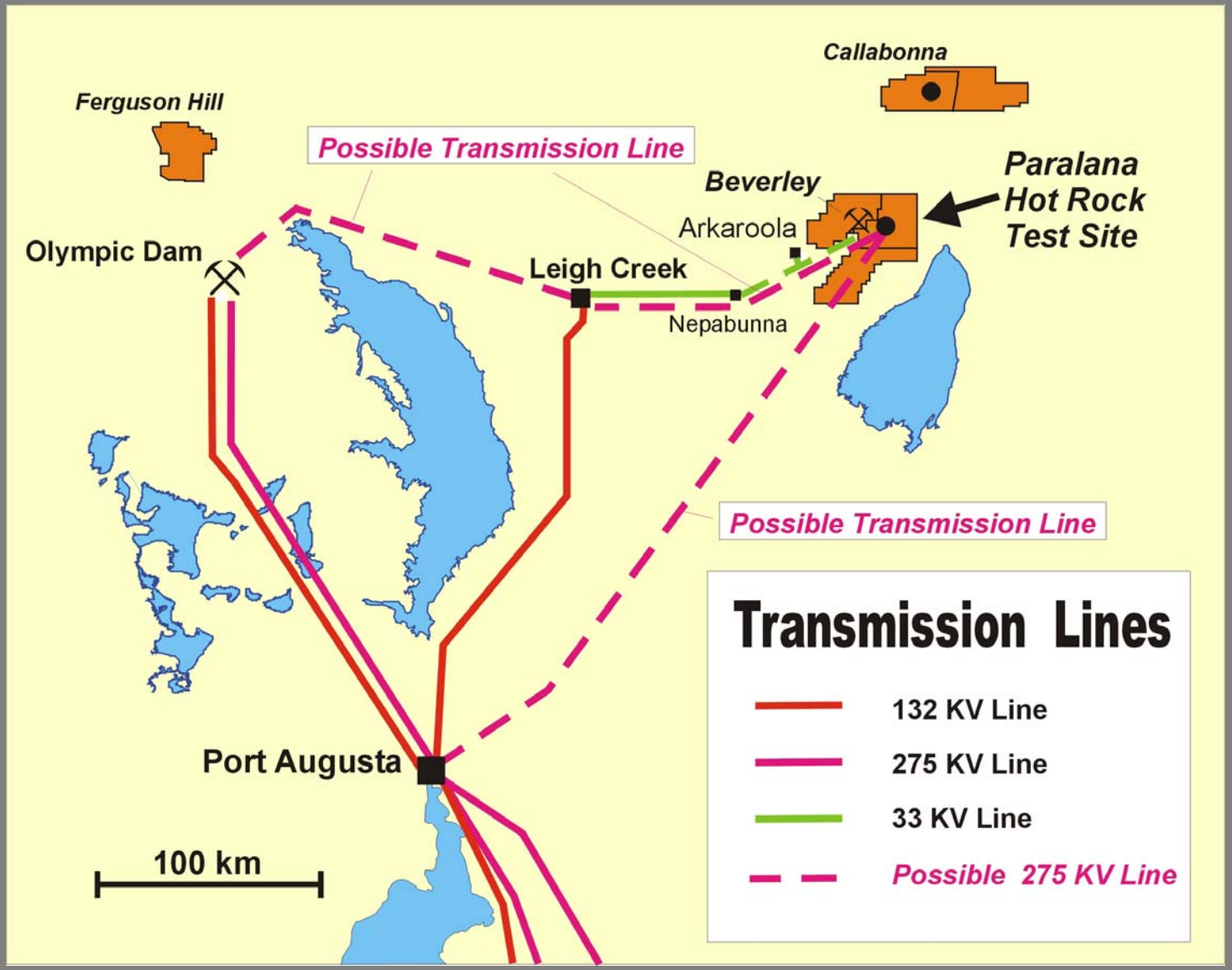
- Excellent thermal resource at shallow depths with stable geological formation - expect good drilling conditions
- Close proximity to the “off-grid” Beverley Uranium Mine
- $30 M JV with Beach Petroleum and $5 M Federal Grant
- A unique and realistic, long term commercialization plan

Paralana Recent Matters

- Seismic study recently completed & Magneto-telluric survey almost complete
- Number of well design scenarios and related rig options assessed – for various drill depths and well outputs (MW)
- Assessed by previous Federal Government as most commercially advanced geothermal project – election commitment for LETDF grant funds for 30 MW demonstration plant ($50 M)

petratherm

Paralana Commercialization Plan

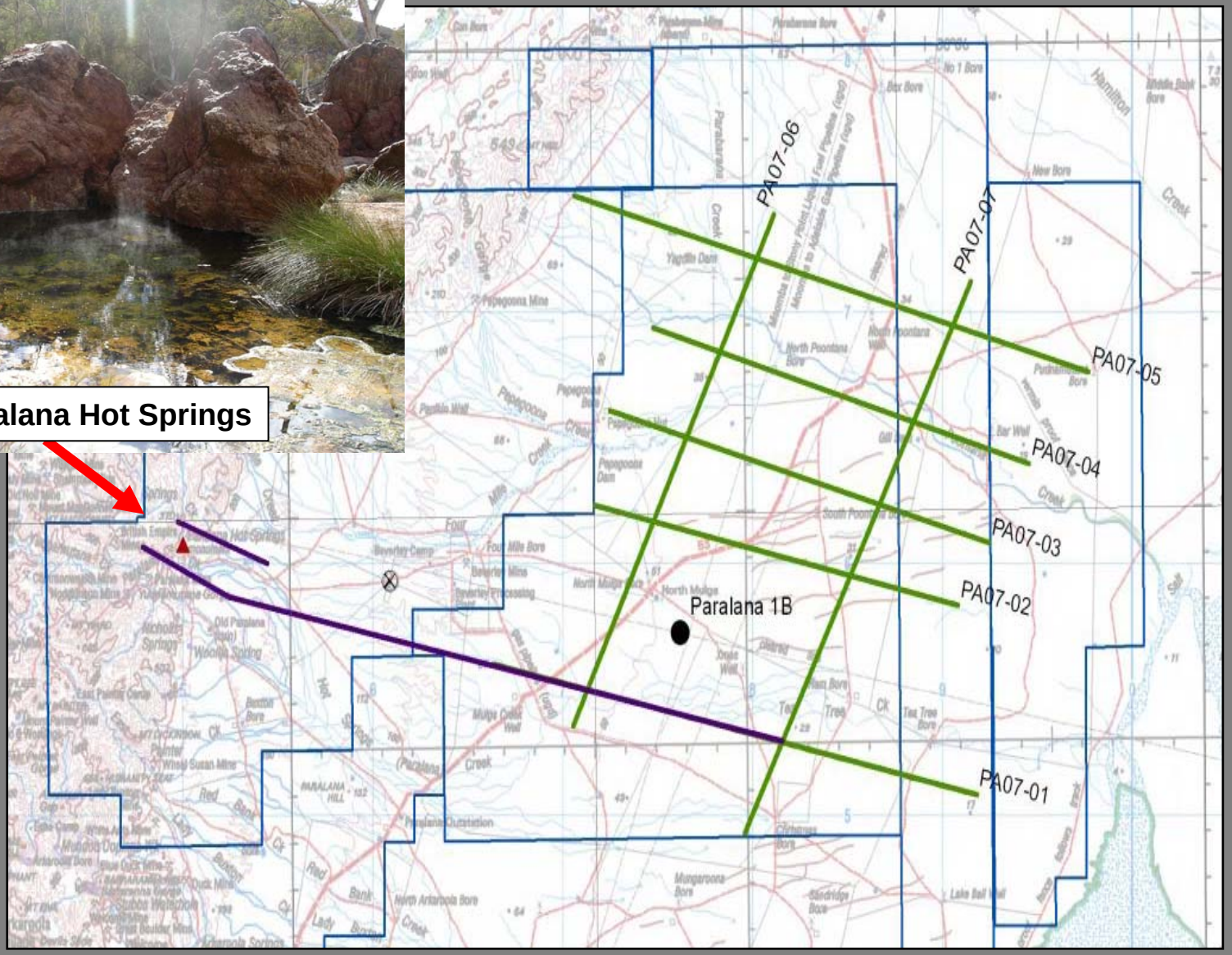


petratherm

Paralana Seismic Survey

Seismic & MT Survey Lines

Paralana Hot Springs



Paralana Geothermal Energy JV Project

Recent & Next Steps

- Deep well design/drilling rig selection completed – Letter of Intent signed with Ensign International Energy Services
- Subject to confirmation of well design parameters and commercial arrangements
- Optimal solution well design/ rig solution selected – spud first well in second half of 2008
- Apply for up to $10 M in drilling funding for 2 well program
- Apply for $ 50 M, 30 MW demonstration plant funding
- Drilling second well – 3 to 6 months after first well
- Long term circulation tests early/mid 2009
- Produce first power to Beverley – early 2010

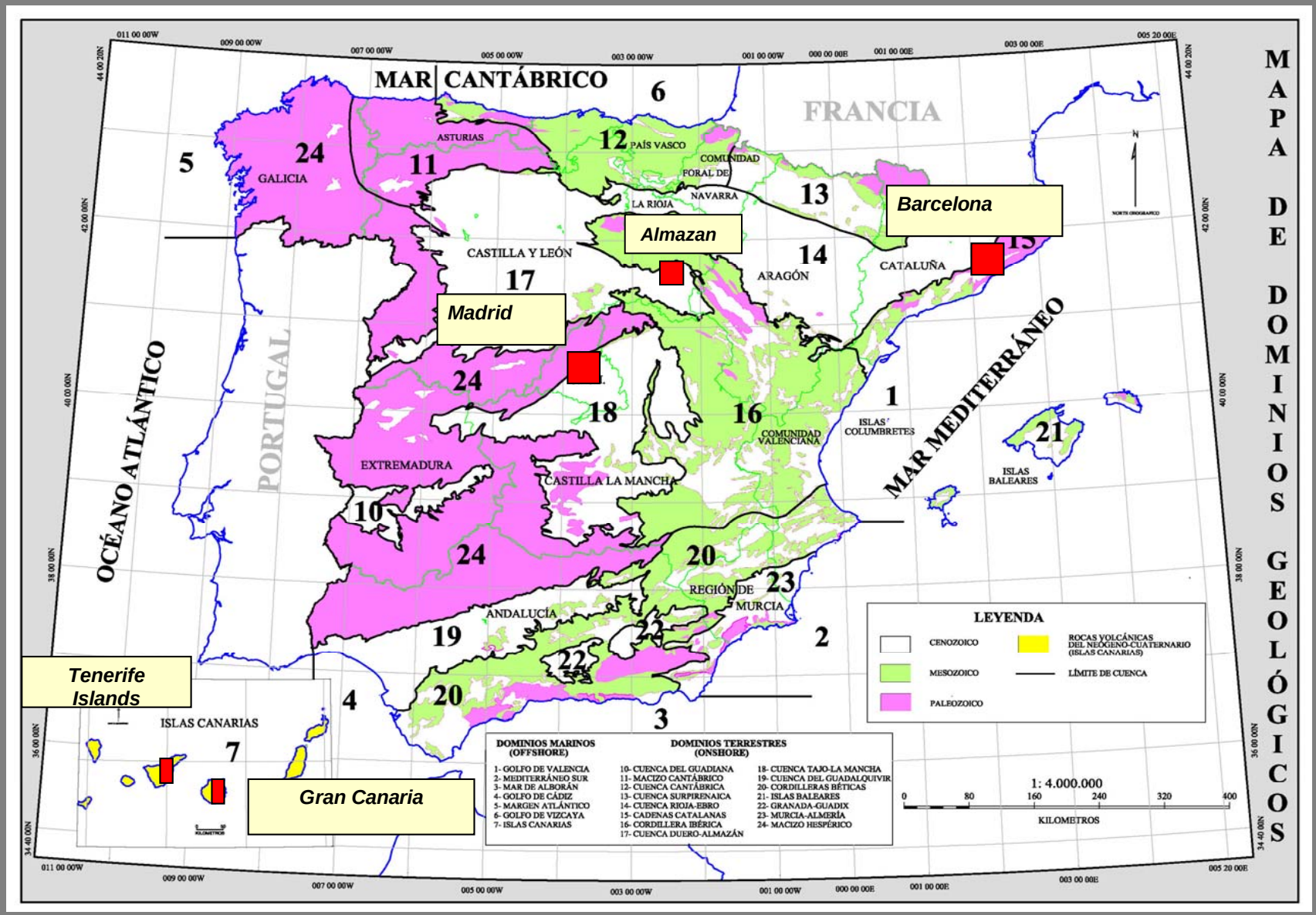
petratherm

Petratherm Espana

- *Geology is conducive to EGS*
- *Expanding Project Portfolio*
- *Strong Corporate Interest*
- *High Electricity Prices*
- *Leading Policy Development*
- *Conventional geothermal and direct use options*
- ***Lower Cost and Risk!***

petratherm

Petratherm Spanish Projects



China – APP Program

- Asia Pacific Partnership Approved Project (APP) with the support of the Chinese and Australian Governments
- Over 240 recorded geothermal sites
- Conventional Geothermal Potential ~1400 MW
- Enormous EGS (Hot Dry Rock) Potential
- Hot Water and Electricity Plays in a number of provinces
- Agreement with Chinese Geology and Geothermal groups
- Joint Venture discussions under way with interested parties

Ningzhong - Tibet

Exclusive Cooperative Agreement to identify high prospect geothermal energy projects in China with four Chinese Government Institutions

- **Chinese Geothermal Energy Society**
- **Geological Survey of China**
- **Chinese Academy of Sciences**
- **China Institute of Geo-Environment Monitoring**

Boiling Springs – Yunnan Province, China

petratherm

Challenges for EGS Projects

- Securing a quality site – the three locations – optimizing economics in a competitive market.
- Confirming the quality of the potential resource – temperature differential, stress regime / permeability.
- Deep drilling of wells – well design, drilling rig availability and costs.
- Establishing long-term circulation between injection and production wells -permeability, fracturing, flow rate.
- Integration of above-ground generation plant with below-ground thermal resource, achieving reliable power plant output – then followed by up scaling of generation capacity.
- Electrical connection (transmission) to the National Electricity Market.
- Water quality, usage, net losses, rights, obligations, accessibility, environmental impacts – short and long term – small and large scale.

Increasing Shareholder Value

- Cost Reduction
  - HEWI Model - shallower wells reducing drilling costs
  - Competitive sourcing of plant and equipment – “no ties” to a plant manufacturer – “ fit for purpose” – conventional, lower cost plant
- Risk Reduction
  - Initial project selection – targeting lowest cost to relevant market
  - HEWI Model – shallower wells, less drilling, greater permeability
  - Several quality projects and a continuous pipeline of projects
  - Project portfolio spread across jurisdictions – local and overseas
  - Partner selection – key skills and capabilities – Beach Petroleum
  - EGS and lower risk conventional geothermal projects
- Revenue Optimization
  - Target local “off grid” opportunities – nearby mines
  - Exploit multiple products – electricity and direct use heat
  - Focus on attractive jurisdictions price and growth – Spain/China

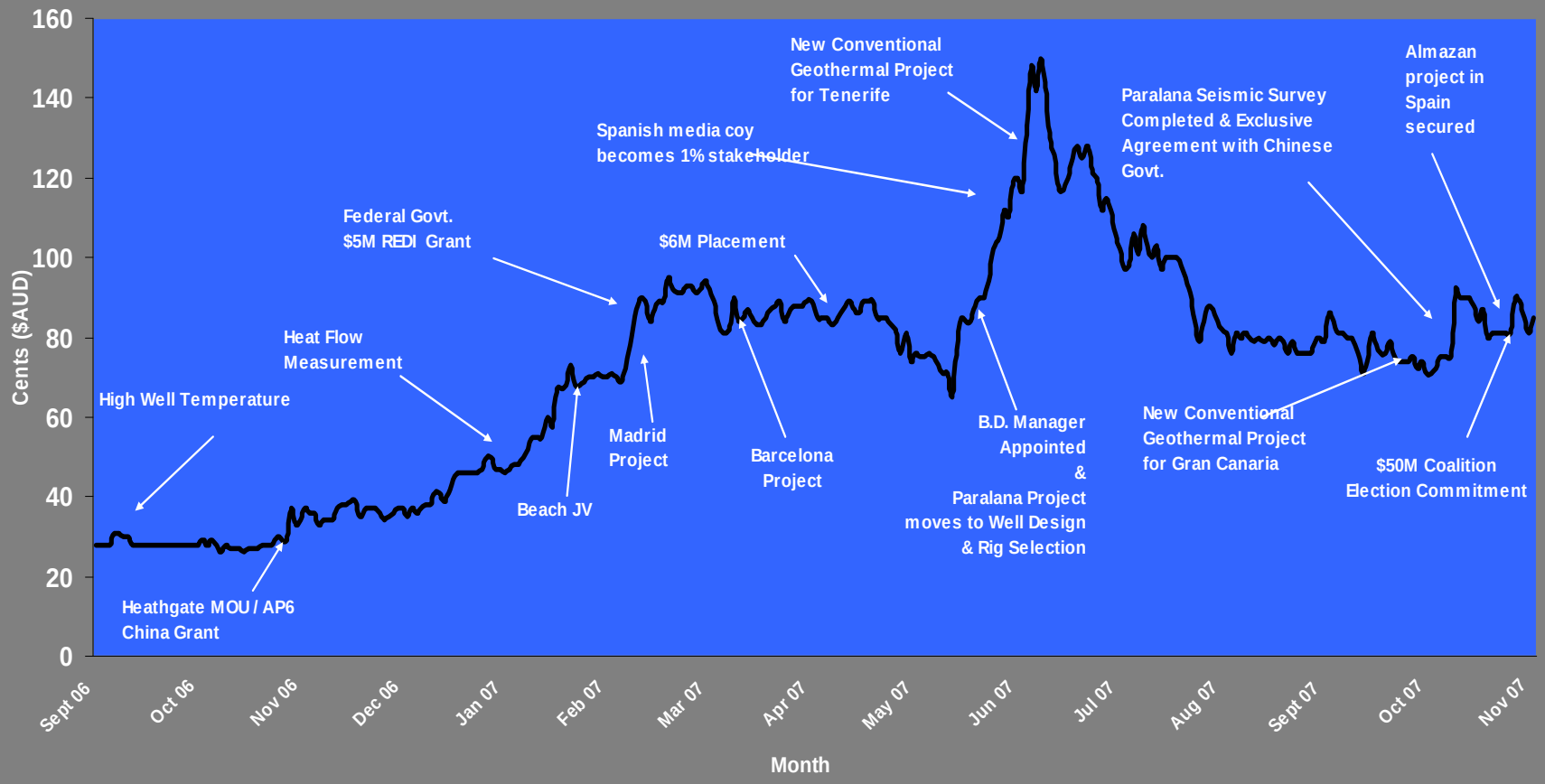
Petratherm - 2007/2008 Achievements & Progress

- Two new Spanish Projects announced Almazan Basin - Conventional Geothermal in Gran Canaria, Canary Islands
- Consolidated first mover advantage in Spain with 5 projects –up to 8 planned – creating significant interest in Spain (energy, renewable & government sectors)
- Three EGS & two Conventional – with electricity and hot water products
- Exclusive Agreement with four Chinese Geothermal/Geological Institutions to identify high prospect projects in China
- Paralana well design and rig selection process – nearing completion
- Leadership roles in AGEA, AGEG & AGIDF – and highly successful policy advocacy role as a Director of REGA
- Recognition of Paralana Project – assessed as the most commercially advanced Australian Geothermal Energy Project

Photo: Callabonna Project Area, South Australia

petratherm

Petratherm - Share Price History



petratherm

Summary of Key Messages

- Petratherm's key strength lies in its approach to "exploration for heat" and its commercial assessment of projects - "location, location, location".

- The approach has resulted in a portfolio of quality projects in Australia and Overseas – first mover in Spain for "Hot Rocks".

- Petratherm's unique HEWI model has the potential to concurrently and substantially reduce costs and risks – also reducing the time for delivery

- Petratherm has, in its Paralana Project, clear commercial and competitive advantages with a willing potential customer at "off grid" prices and a realistic long term commercialization path – *unique path to commercialization*

- Petratherm's business focus is to increase shareholder value through a clear combination of strategies that reduce cost, reduce risk and optimize revenue

petratherm

Thank You

petratherm

ASX Code: PTR

www.petratherm.com.au

Phone: (08) 8274 5000