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PETRATHERM LIMITED
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PETRATHERM UNIQUELY POSITIONED FOR SUCCESS IN THE AUSTRALIAN AND INCREASINGLY GLOBAL GEOTHERMAL ENERGY SECTOR

Hot rock developer, Petratherm Limited, (ASX : PTR) says the Company has entered the new financial year uniquely positioned for success in the geothermal energy sector in Australia, and increasingly globally.

The upbeat outlook was contained in a presentation by Petratherm Business Development Manager, Mr Jonathan Teubner, to the **LINWAR Securities Renewable Energy Briefing in Sydney** earlier today.

Highlights of the talk were:

- **Explanation of Petratherm's key points of differentiation and advantages in the sector, including its approach to exploration, HEWI model for heat extraction and its unique path to commercializing its Paralana Project.**

Yours faithfully

Terry Kallis
Managing Director

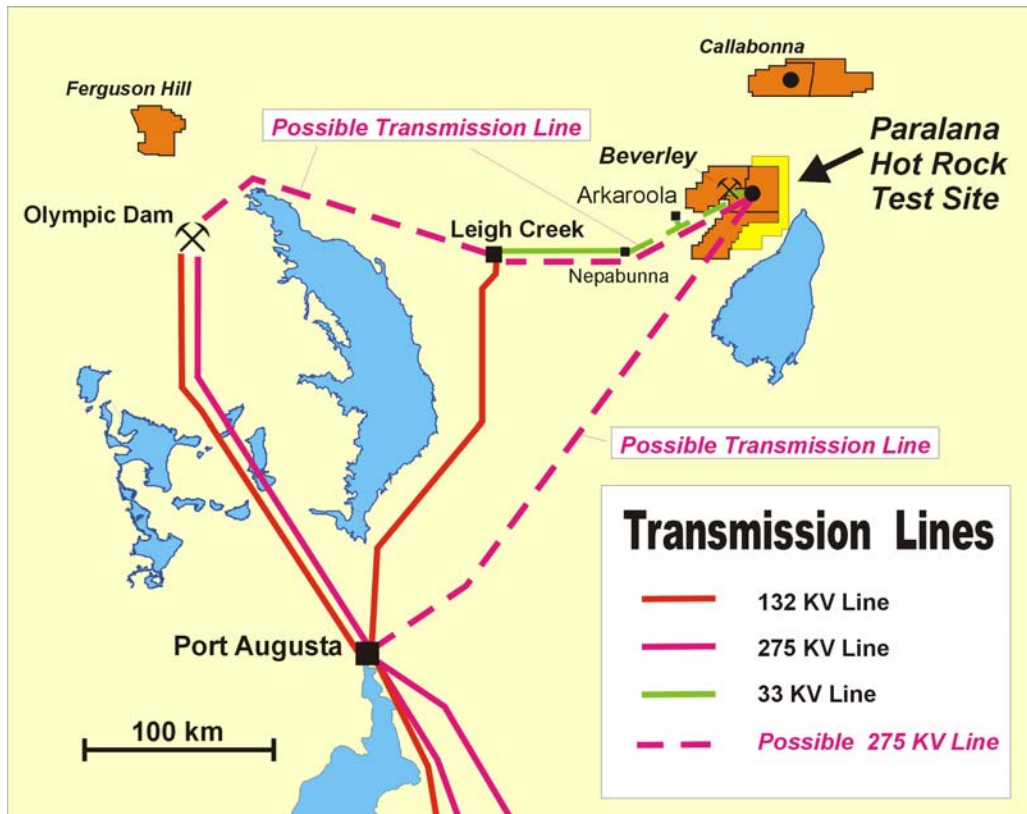
- **Petratherm's commencement of deep well design and rig selection process for the Paralana Project using Australian Drilling Associates and US geothermal energy experts Global Power Solutions.**
- **First mover advantage in Spain with projects near the large markets of Madrid and Barcelona – and a continued expansion of the Spanish project portfolio and the potential for early advancement of projects.**
- **The granting of key permits on the island of Tenerife in the Canary Islands giving access to potential conventional geothermal projects, allowing Petratherm to have a project portfolio diversified across geothermal technologies as well as across markets.**
- **An outline of the key economic parameters and project considerations critical to a successful geothermal energy project.**
- **Confirmation of the potential of “hot rocks” to provide low cost, large scale, base load, renewable power – a highly attractive political, economic, social and environmental global energy solution.**

In his address, titled ***‘Building a Portfolio of Quality Geothermal Energy Projects – Australia and Overseas’*** (refer attached and PTR website), Mr Teubner said Petratherm's emerging leadership in the “hot rock” energy sector could best be summarized by the following key points:

- Petratherm's unique exploration model and process developed in collaboration with the University of Adelaide has positioned the Company to be able to “explore for heat” and to quickly assess the viability of geothermal projects – across a variety of geological settings, end use markets and regulatory regimes in various countries.
- The Company's strength in hot rock exploration has enabled it to create a portfolio of quality geothermal energy projects in Australia and Spain, with more to come in those countries, and soon in China – where Petratherm has the support of the Chinese and Australian governments through the Asia-Pacific partnership. Of particular importance has been Petratherm's move this year into Spain where it has secured strategic ‘first mover’ advantage with projects near the large electricity consumption markets of Madrid and Barcelona as well as access to conventional geothermal acreage on the island of Tenerife in the Canary Islands.
- Petratherm's unique Heat Exchanger Within Insulator (HEWI) Exploration Model has the potential to considerably reduce cost and risk, and thus bring forward the viability of large-scale geothermal projects in Australia and indeed overseas - a key point acknowledged by the Federal Government in awarding

Petratherm a \$5M REDI Grant towards developing the HEWI Model at the Company's flagship Paralana Geothermal Project site near Leigh Creek in South Australia.

- The prospects for the two Spanish projects are very encouraging. This assessment was made following visits to the sites by Petratherm's Australian and Spanish representatives and the recent confirmation of the availability of data from previous deep oil and gas wells. In particular, the Madrid project has three wells drilled to depths of 3.1 to 3.5 kilometres – providing critical temperature, hot water flow rate and geological data. This provides the opportunity for significant and low cost, project advancement over the next several months.
- The Paralana Project has now assembled all the key 'ingredients for success' including:
 - An excellent thermal resource at shallow depth – estimated at 200°C at 3.6 kilometres.
 - A stable geological formation with expected good drilling conditions.
 - Close proximity to a willing potential customer that currently pays 'off-grid' prices.
 - A joint venture with Top 5 Australian oil and gas explorer and producer, Beach Petroleum Limited, for up to \$30 million in which Beach will take the lead role in the drilling operations required to create the underground heat exchanger.
 - A \$5 million Renewable Energy Development Initiative (REDI) Grant from the Federal Government to assist in the creation of the underground heat exchanger.
 - A unique and realistic long-term commercialization path that provides the potential for commercial viability at all stages including small scale (i.e. 7.5MW), local market (up to 30MW) and into the National Electricity Market (NEM) (between 260 and 520MW).
- The Paralana Project is considered uniquely positioned to enable commercial viability at small scale (7.5MW building over time to 30MW), an important factor in the development and "bedding down process" of any new technology. This is a direct result of the close proximity of the Beverly Uranium Mine and the current 'off-grid' prices.
- Large-scale development of the Paralana site – following the development and "bedding down process" - also provides a unique opportunity for Petratherm's Paralana Project with flexibility and significant cost benefits associated with potential large-scale transmission network solutions to competitively access the NEM at Port Augusta and/or Olympic Dam (refer below)



- The planned delivery of large-scale power (up to 520MW) has taken into account the capacity of the market to digest large increments of generation competition from other geothermal and indeed traditional sources of power generation and the cost of delivery (transmission network) of electricity to the 'on-grid' market (NEM).
- Petratherm's two basic network solutions include:
 - A double circuit 275kV transmission line from Paralana to Port Augusta capable of delivering 520MW into the NEM at Port Augusta. ("Radial network solution").
 - A single circuit 275kV transmission line from Paralana to Port Augusta and a single circuit 275kV transmission line from Paralana to Olympic Dam, each capable of delivering 260MW to those entry points. ("Meshed network solution").
- The latter network arrangement would create a "meshed" transmission network in the north of the State and provide a backbone of electricity infrastructure for the remote community, but in particular the State's growing resources sector. Importantly, the "meshed" network solution has the potential to provide substantial broader community benefits and hence has the potential for the inclusion of a proportion of assets (and costs) into the regulated asset base of a registered transmission owner under the Australian National Electricity Rules

(NER). Accordingly, there is unique opportunity for substantially reducing the overall project network connection costs.

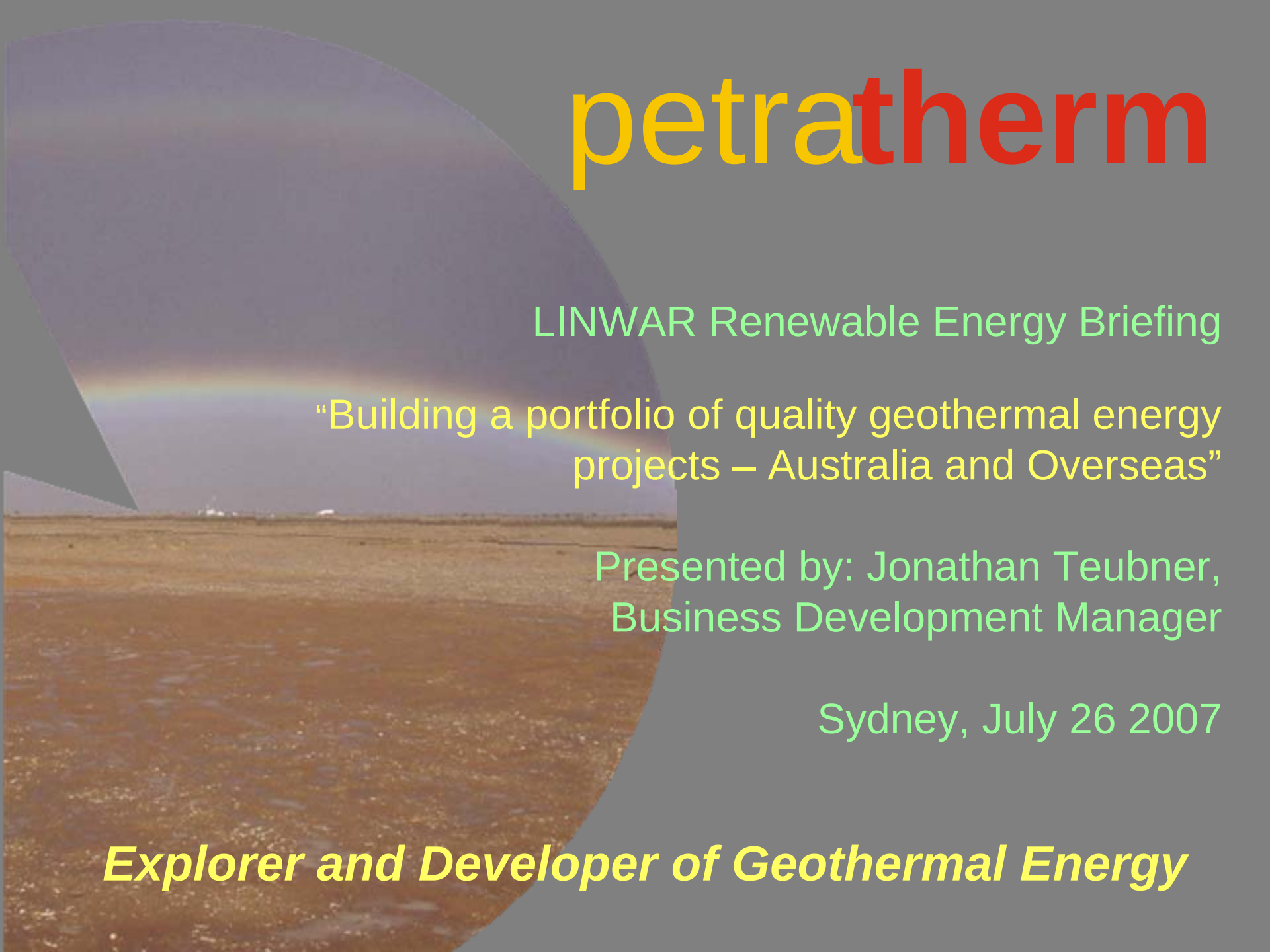
- Similar opportunities exist for the radial network connection where the prime cost reduction occurs through the utilization of a single electricity tower carrying both 275kV electricity circuits.
- Petratherm's strategic approach has been to apply the skills of a multi-disciplinary team (internal and external) to understand and assess the market, regulatory regime, technology and geological characteristics of potential projects in order to maximize potential value of those projects whilst concurrently minimizing project risks. Petratherm's 'exploration for heat' and HEWI models were created as a result of that strategic approach and Petratherm is committed to find ways to continue to reduce costs and risks.

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LINWAR Renewable Energy Briefing

“Building a portfolio of quality geothermal energy projects – Australia and Overseas”

Presented by: Jonathan Teubner,
Business Development Manager

Sydney, July 26 2007

Explorer and Developer of Geothermal Energy

Presentation Outline

- Key Messages
- Corporate Overview
- Petratherm's Unique Exploration and HEWI Models
- Key Projects – Australia & Overseas
- Economics of Geothermal Energy Generation
- Geothermal Energy and Electricity Markets
- SA Electricity Market and Geothermal Projects
- Geothermal Project Economics and Development
- Paralana short/long term Commercialization Plans
- Key Challenges for Australian EGS Projects
- 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
- *Geothermal Energy – conventional and “hot rocks” can provide low cost, large scale, base load, renewable power - highly attractive political, economic, social and environmental global energy solution*

Corporate Overview

- Established in 2003 and listed on the ASX in July 2004
- Major shareholder is Minotaur Exploration – 34%
- Recent successful capital raising - Placement & SPP, \$6.3 M
- Shares on Issue - 57,750,000 – Current Price of \$0.97
- Market Capitalization of \$ 56 million
- \$8 M in cash, \$ 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 ”*

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***

Petratherm's Exploration Model

"Shallow Hot Rocks close to Market"

***"Hot Rocks" are EGS , i.e.
Enhanced Geothermal Systems***

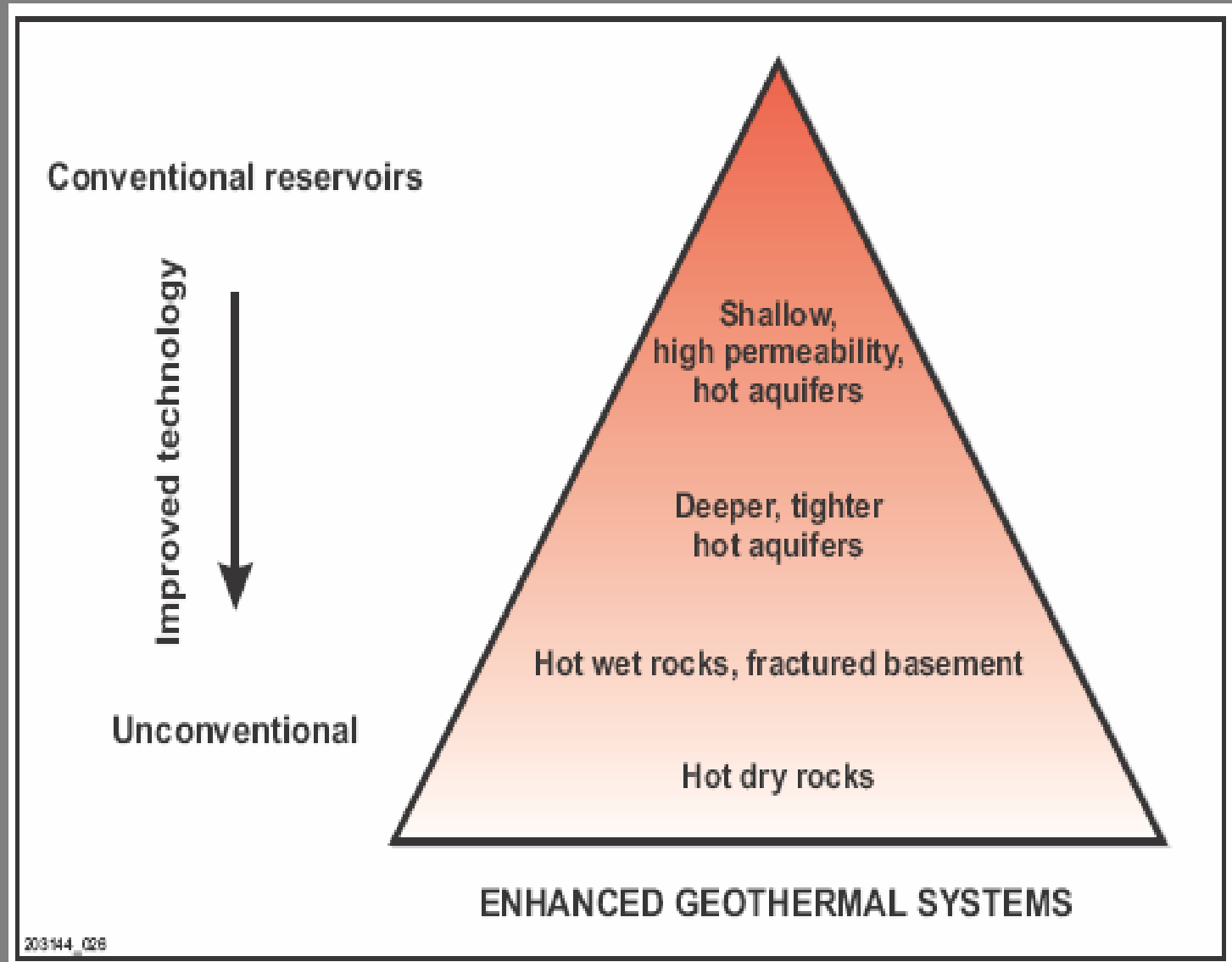
Prime Cost Drivers

- 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.

Enhanced Geothermal Systems

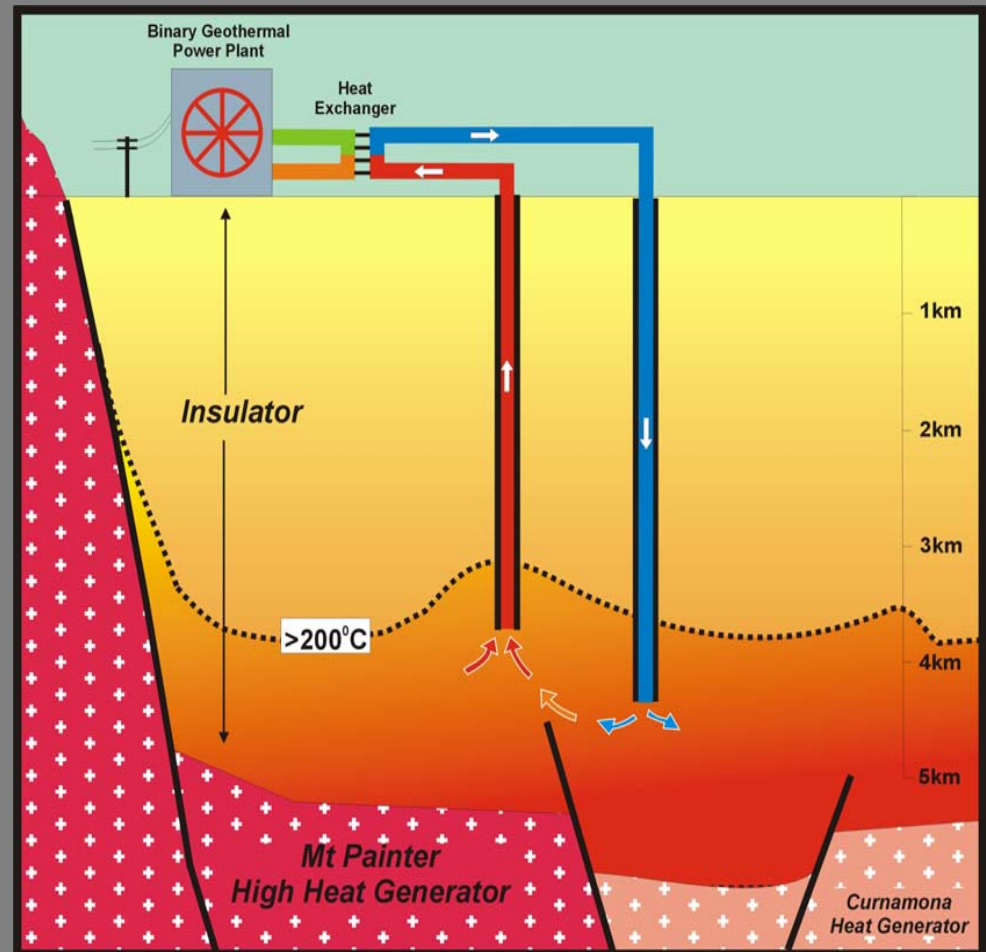


Heat Exchanger Within Insulator (HEWI) Model

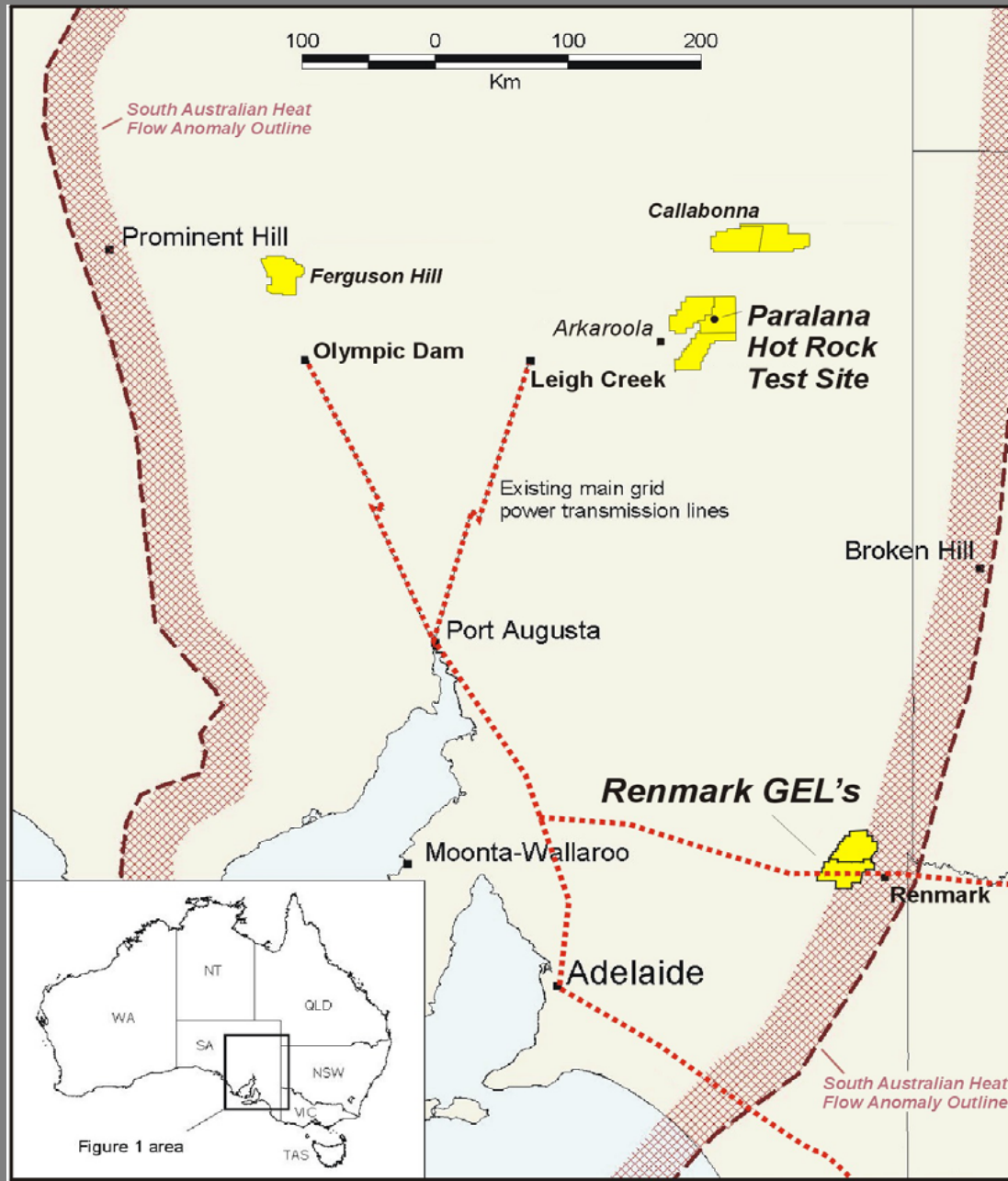
EGS -
enhance/engineer
the geothermal
system that is
underground heat
exchanger

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

= Cheaper Power!



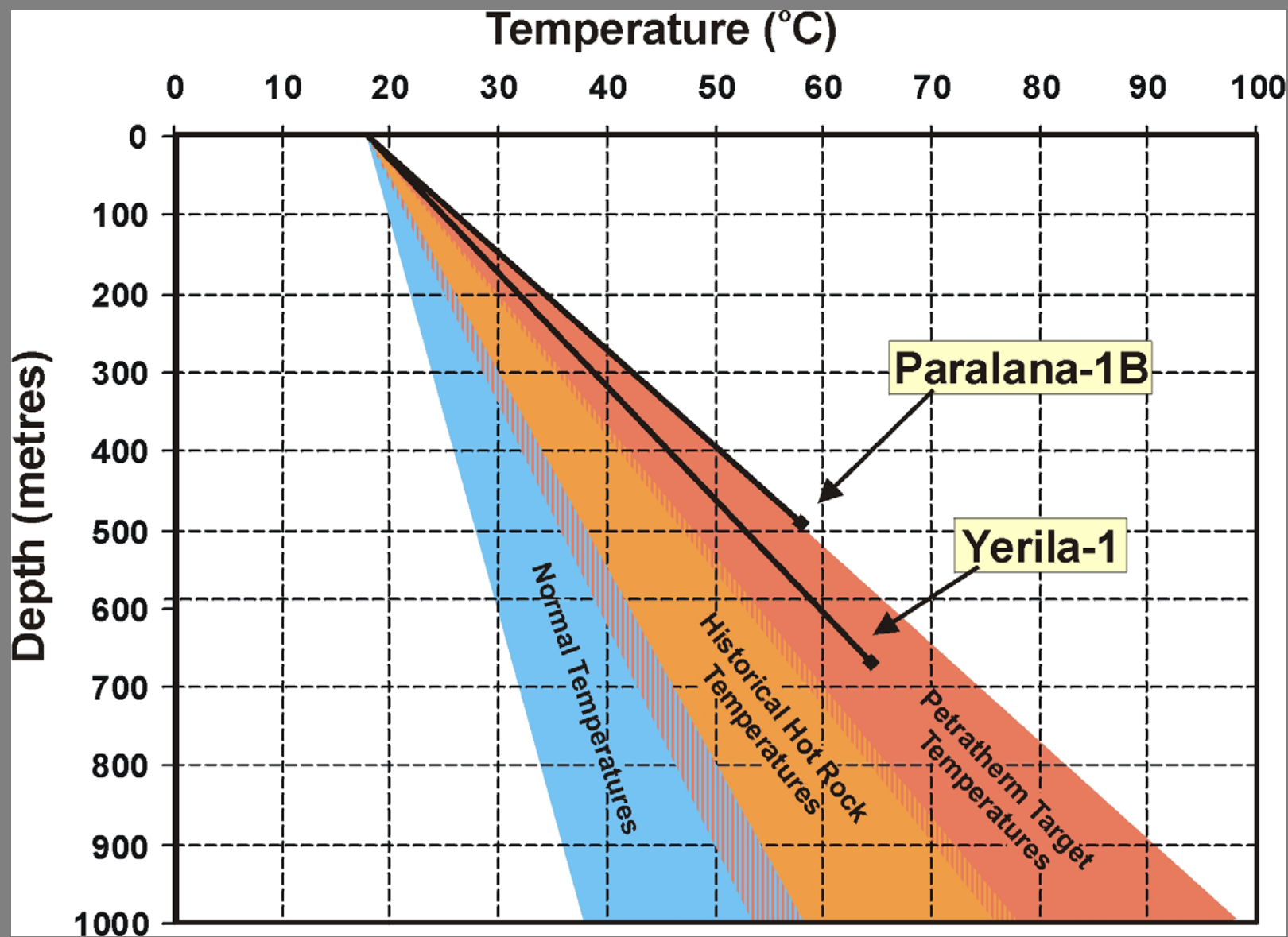
Petratherm's SA Projects



Paralana Hot Springs – 62°C



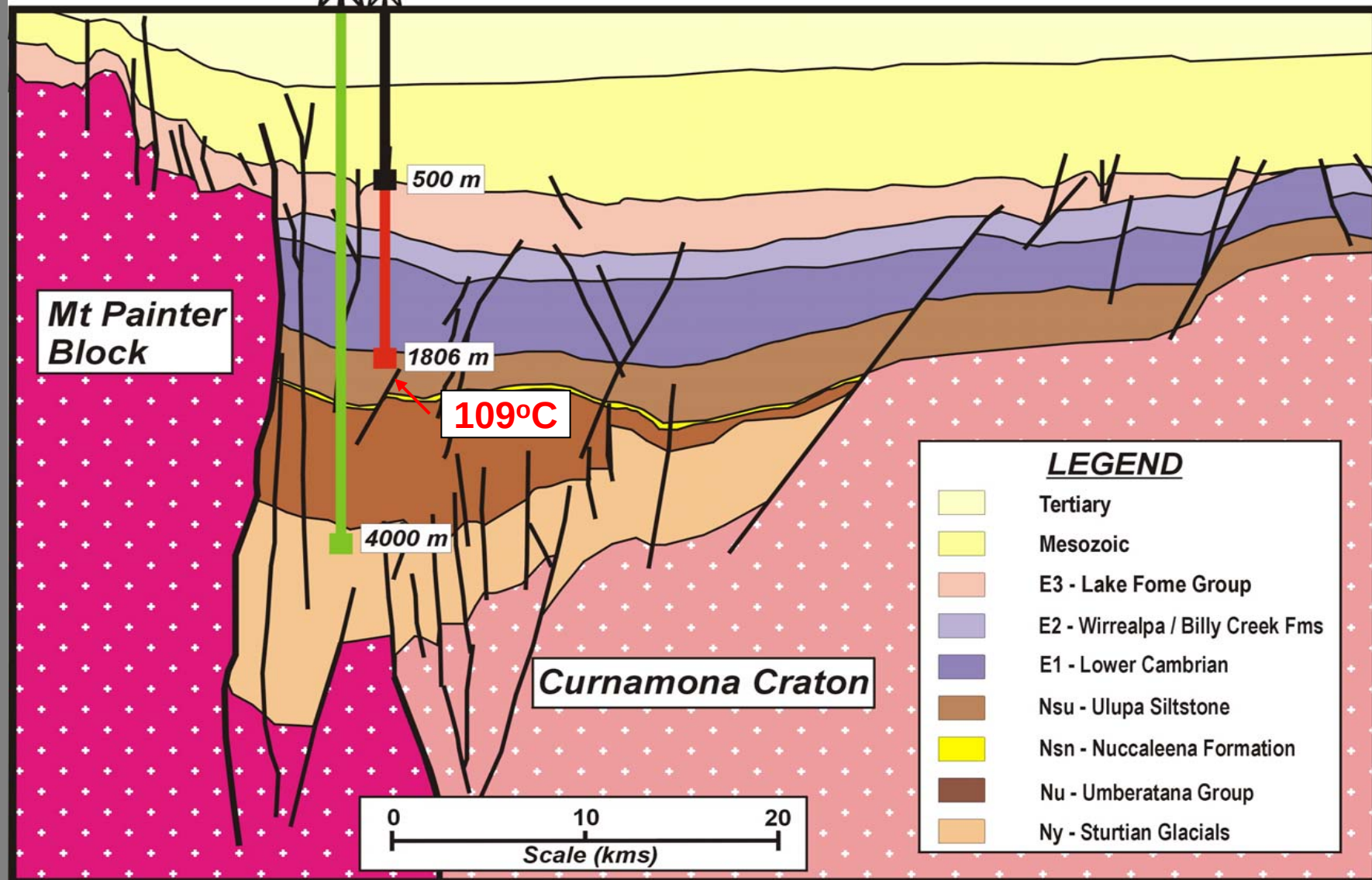
Outstanding Thermal Resource



Paralana 2
Phase 3 drilling

Paralana 1

Paralana Work Program



petrath^{erm}

Temperature measurements indicate 200 degrees C at 3.6km

Renewable Energy Country Attractiveness Indices

- *Tariffs*
- *Resource Potential*
- *Growth*
- *Grid Capacity*

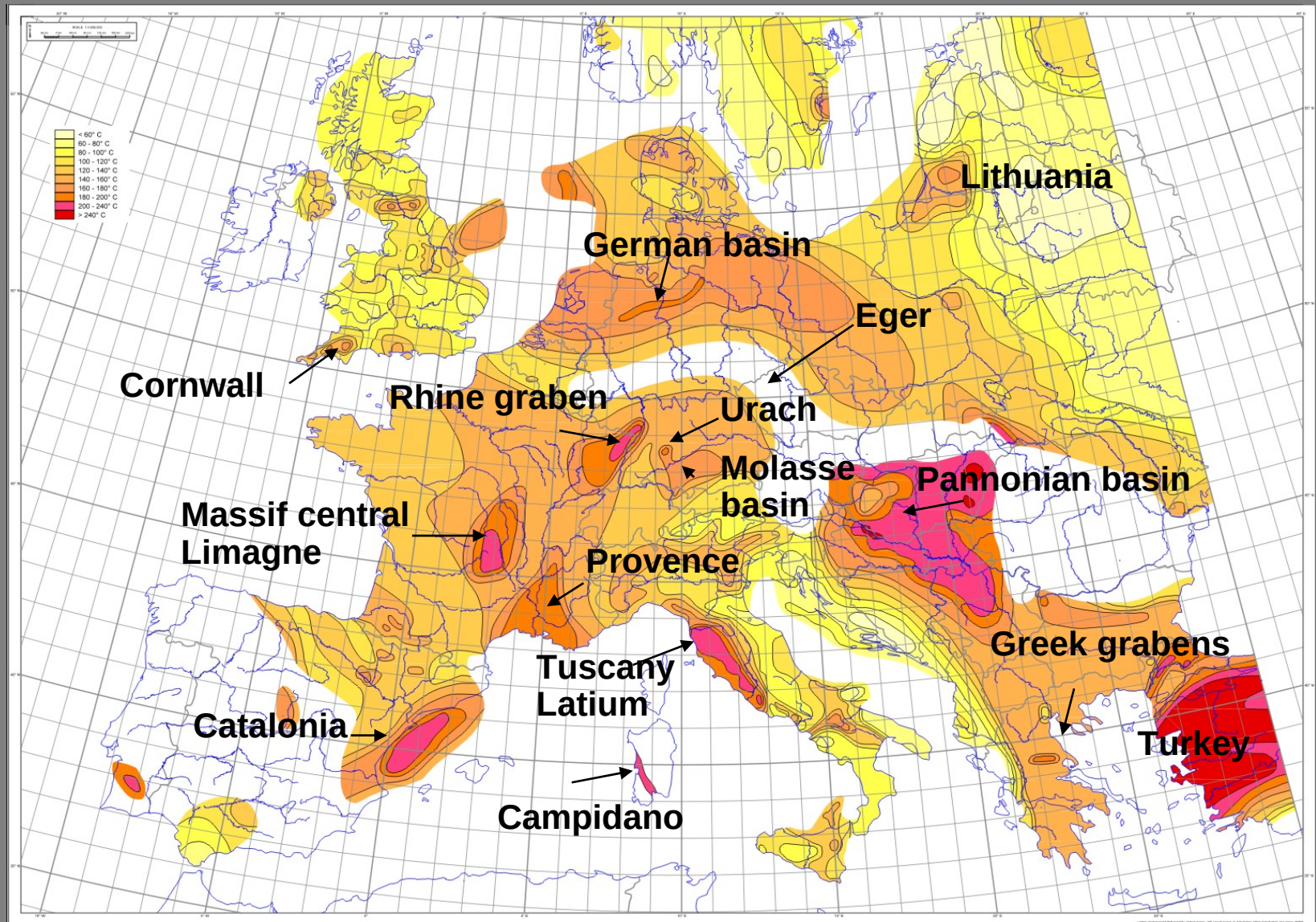
Source : Ernst & Young 2006

Ranking	Country	All Renewables Index	Renewables Infrastructure Index
1	Spain	69	80
2	USA	67	70
3	Germany	62	56
4	India	61	66
5	UK	60	61
6	Italy	58	63
7	France	57	55
8	Portugal	56	63
9	China	56	59
10	Canada	55	63
11	Netherlands	54	56
12	Ireland	54	61
13	Greece	53	56
14	Sweden	52	53
15	Australia	50	51
16	Denmark	49	58
17	Norway	49	56
18	Belgium	48	53
19	Finland	38	39
20	Austria	33	49

Wholesale Renewable Power Price's ***cents per KWh (Aus)***

<i>Spain</i>	<i>11.4 – 14.5</i>
<i>USA</i>	<i>10 – 11.5</i>
<i>China</i>	<i>8.6 – 9.5</i>
<i>India</i>	<i>7.8 – 10.1</i>
<i>Australia</i>	<i>7.5 – 8.5</i>

Europe - Extrapolated Temperatures at 5km Depth



Source Hurtig et al., 1992 modified by GEIE EMC, 2000

Madrid Project – Madrid Basin

- Tenement Area 300 km² , located 35 kms NNE of Madrid
- Major electricity and water infrastructure, > 5000 MW of capacity
- Known low enthalpy aquifer (85°C) resource at 1500m and very high flow rates.
- High heat production granites outcropping in the range and likely to underpin the basin, similar setting to Paralana
- Basin thickness approximately 4000 metres
- Three existing deep wells on tenements down to 3.1 to 3.5 kms.
- Potential for early advancement of project during 2007

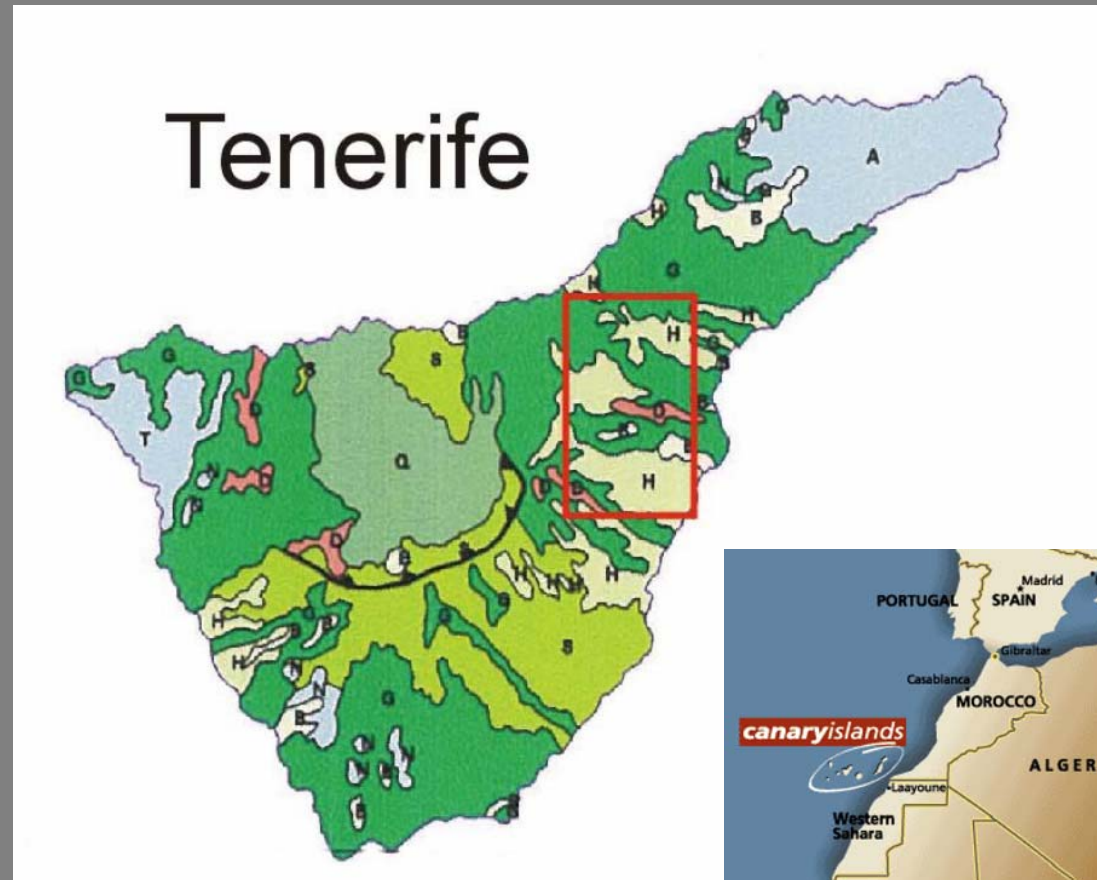
Barcelona Project

– Valles Basin

- **Adjoining Tenements located 30 kms NNE of Barcelona**
- **Central to major electricity infrastructure, >2000 MW of capacity**
- **Area of known high heat flow**
- **Local hot aquifer sourcing a 115-130°C shallow reservoir at around 1000 metres**
- **High heat production granites underpin the basin & outcrop in adjacent ranges**
- **Basin thickness approximately 3500 metres**

Tenerife Conventional Geothermal Project – Canary Islands, Spain

- 10,000 MW of conventional geothermal worldwide
- Known technology, lower risk and earlier development
- Volcanic heat source – typically $>300^{\circ}\text{C}$ at 2kms
- Tenerife population up to 1.5M people during peak season
- Substantial transmission infrastructure in close proximity
- Attractive market and regulatory environment – with high price energy alternatives

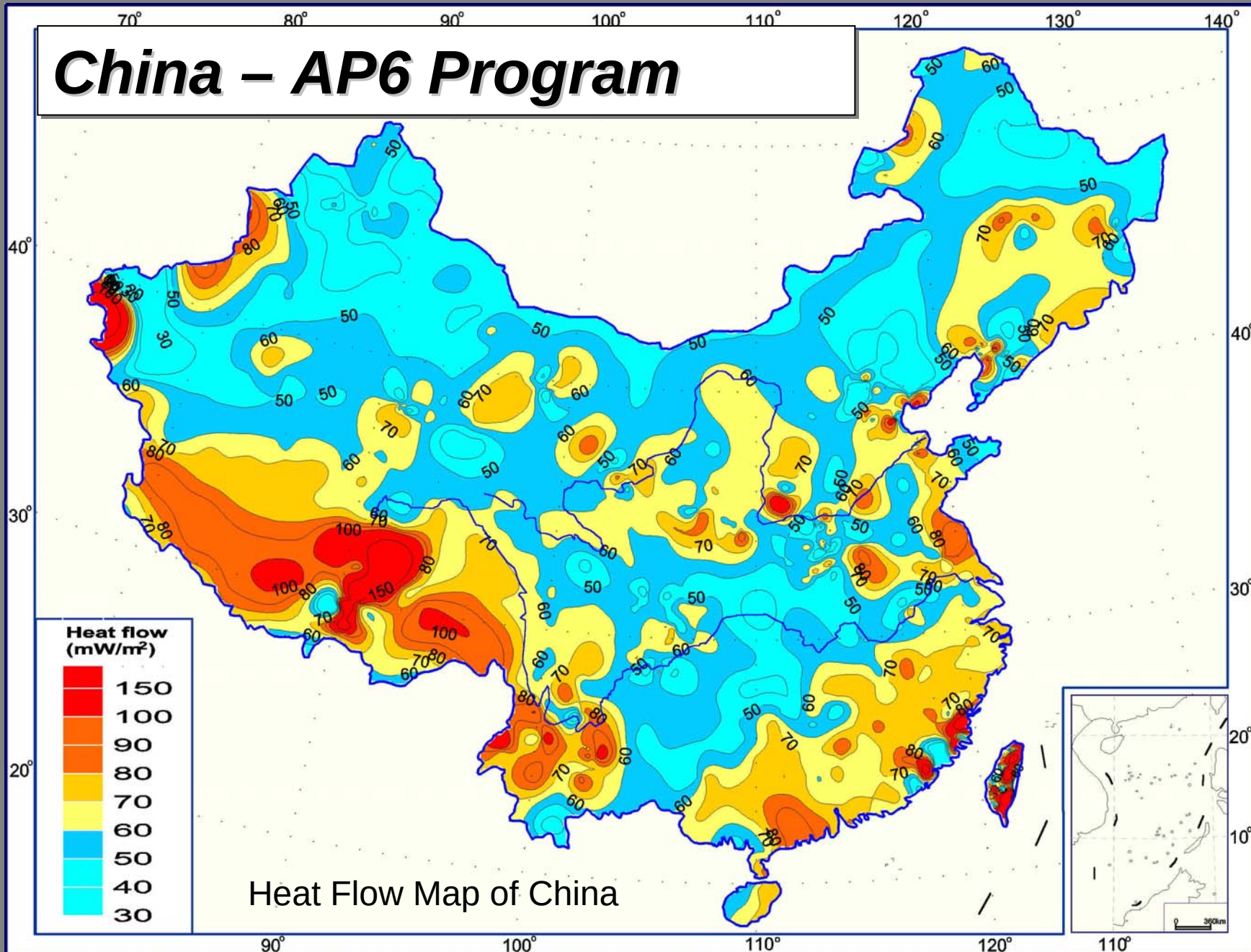


China – AP6 Program

- Asia Pacific Partnership Approved Project (AP6) 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
- Joint Venture discussions under way with interested parties

Ningzhong - Tibet

China – AP6 Program



Source: Hu Shengbiao, He Lijuan and Wang Jiyang. 2000.

Petratherm - Key Achievements

- Discovery of world-class heat resource at Paralana, South Australia.
- Established an MOU with Heathgate Resources to provide their Beverley Uranium Mine with electricity to meet their growing needs.
- Secured approval 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 (more to come)

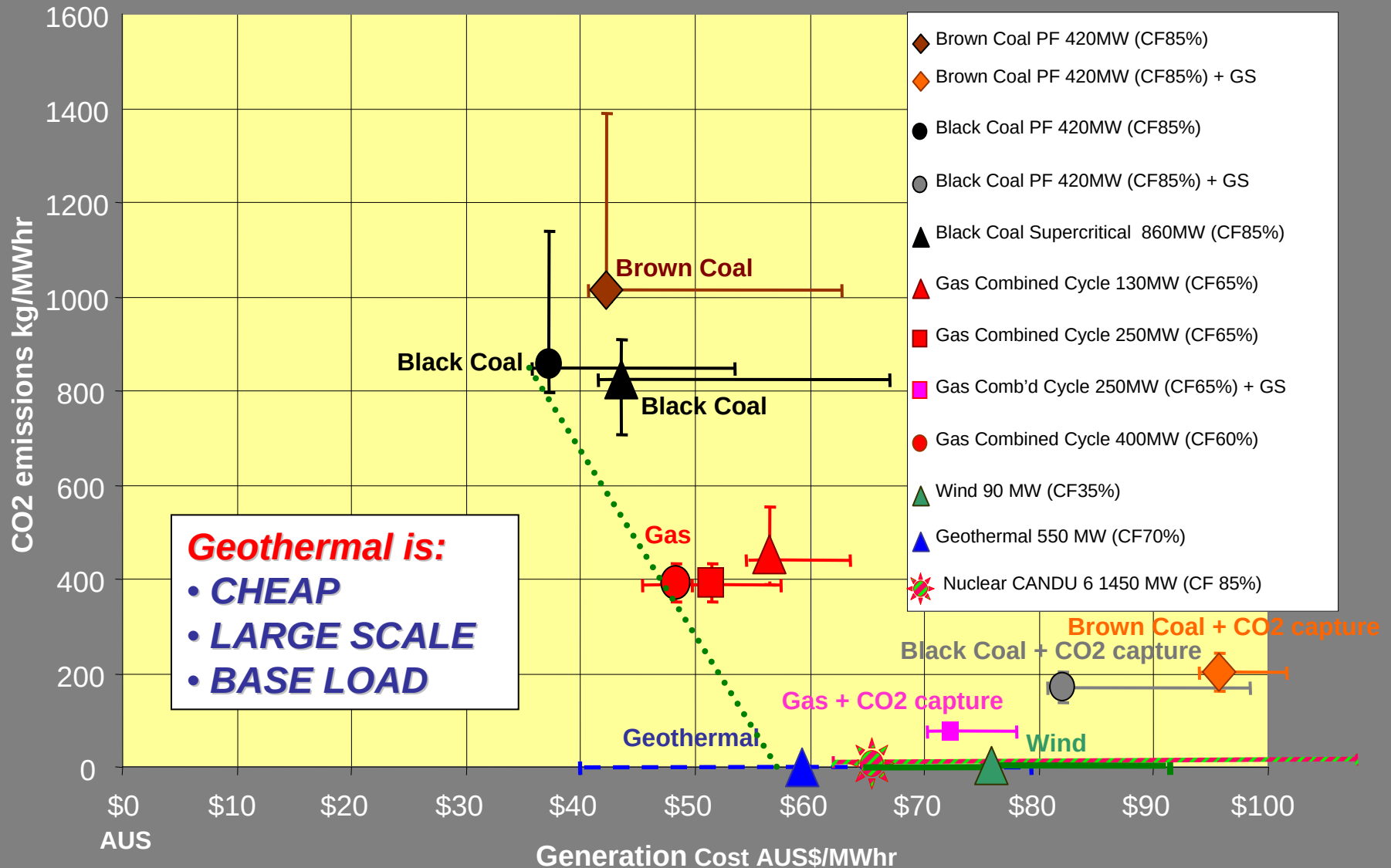
Photo: Callabonna Project Area, South Australia



Petratherm Project Summary

- Build on the Company's key strength of **exploring for heat** and adding **project development** to its capabilities and seeking to continually **lower costs and risks**
- Continue to **expanding its portfolio of quality projects** in Australia and Overseas (Spain and China).
- **Paralana Project** exhibits the **key ingredients for success**
 - Excellent thermal resource at shallow depths with stable geological formation - expect good drilling conditions
 - 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 Project Next Steps**
 - Deep well design and drilling rig selection – late July 2007
 - Drilling first well – subject to rig availability – early 2008
 - Drilling second well – mid 2008
 - Long term circulation tests late 2008
 - Produce first power to Beverley – end 2009

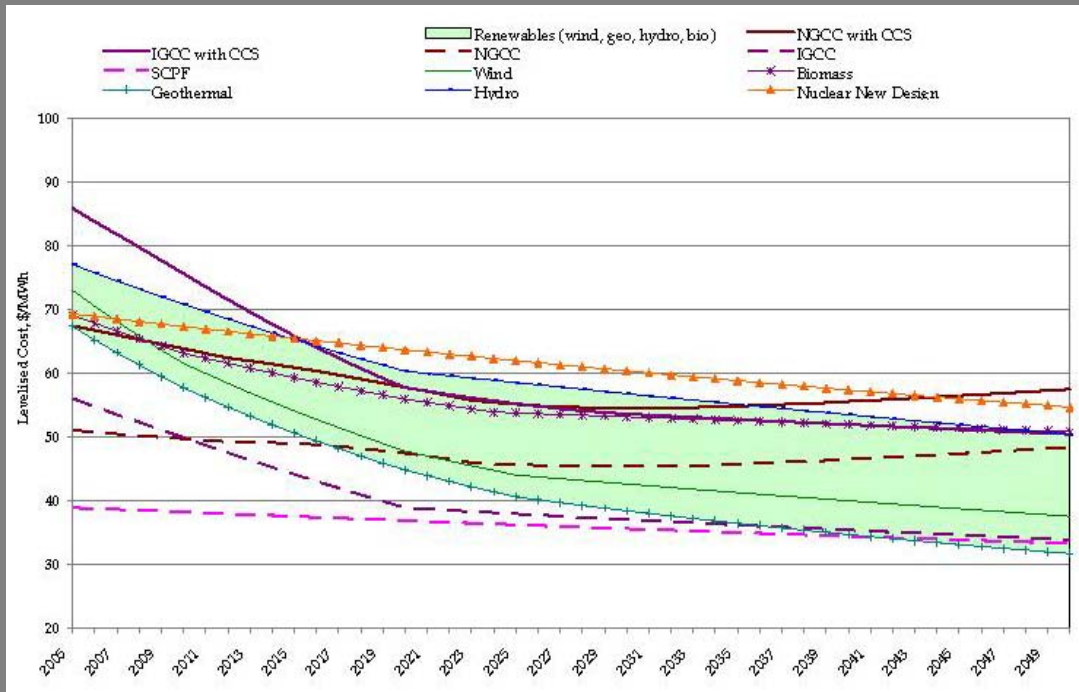
Economics of Geothermal Energy Generation



COMBUSTION CO2 EMISSIONS vs LONG RUN COST
(Source: ESIPC Compilation 2006)

Long Run Costs of Renewable Energy Technologies

- Advantages of Geothermal Energy include:
 - Large scale base load
 - Large resources and reserves
 - Expected to be lowest cost renewable energy source



Extract from **McLennan Magasanik Associates independent report** "Renewable Energy – A Contribution to Australia's Environmental and Economic Sustainability".

Total renewable cost envelope v's coal, gas and nuclear cost.

Geothermal Energy and Electricity Markets

International

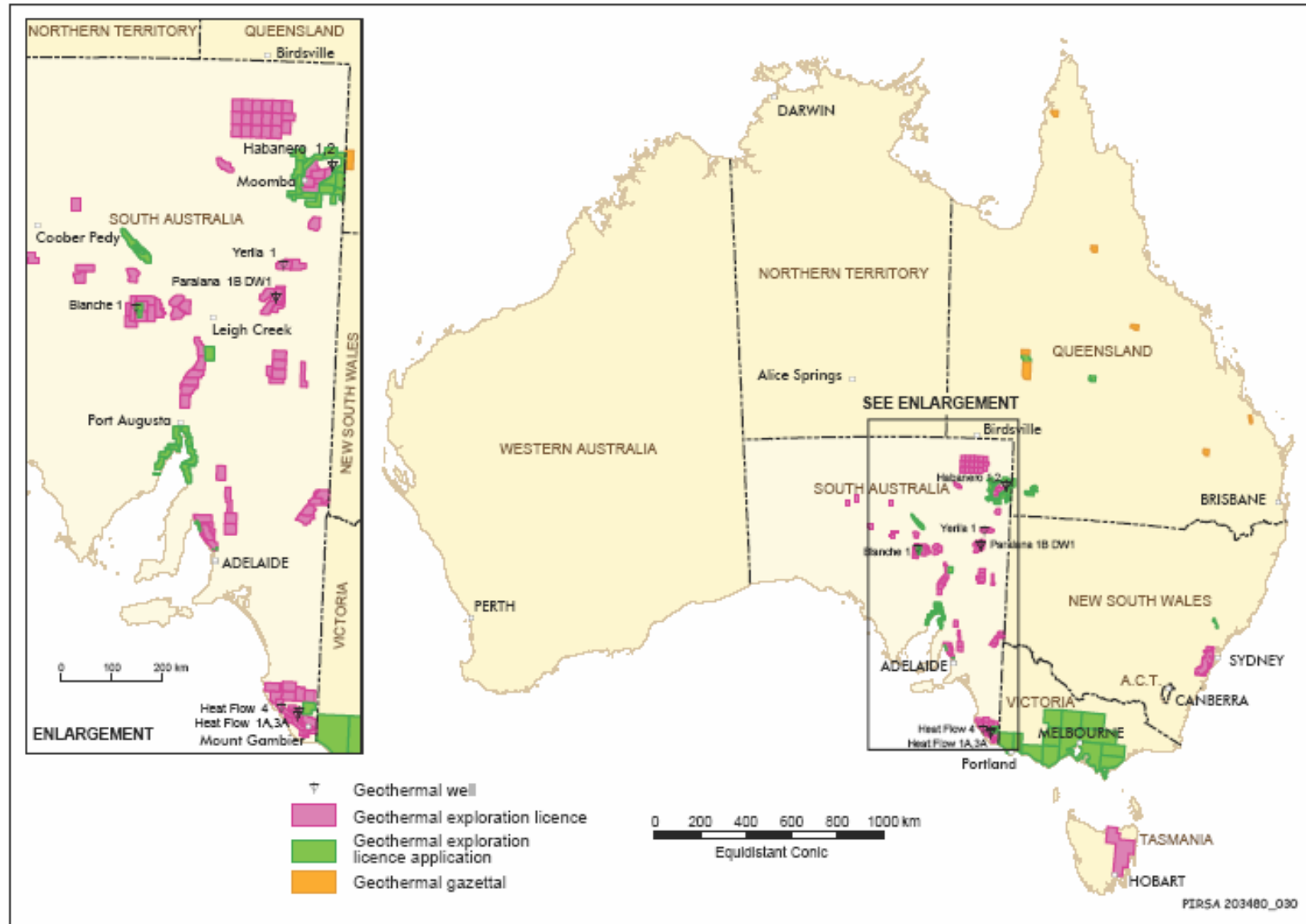
- The global renewable energy market (all forms) represents only 4% of electricity production but is growing at 25% per annum.
- Geothermal energy has largest technical potential of all renewable SOURCES (source: World Energy Assessment UNPD 2000).
- MIT Report suggests that EGS can provide 10% of US power by 2050
- Renewable energy policies with favourable targets and “in-feed tariffs” some over \$140 per MWh
 - European Union target of 20% by 2020
 - China target of 10% by 2020
 - India target of 10% by 2020
 - California target of 20% by 2017

Geothermal Energy and Electricity Markets

Australia

- Review of the Energy White Paper and current policy on renewable and low emission energy technologies – **Emissions Trading** and **Renewable Energy**
- Strong support for geothermal energy due to competitive, large scale, base load potential –**SA Govt. PACE initiative, AGEG and recent Federal Govt. Geothermal Energy Industry Development Framework and Labor Party Policy and Program announcements (\$ 50 million for drilling – 5 projects and MLET?)**
- Geothermal Energy potential is vast and could **meet Australia's electricity needs for many centuries**. The **Paralana thermal resource** potential alone is estimated at **13,000 MW**
- ESAA estimates that **8% (around 3500 MW)** of national demand could be met by **2030**. Geothermal Energy Industry formulating a bold, yet realistic **Vision with objectives for 2010, 2020 and 2030**.
- The interconnected NEM in Australia is projected to require **5,000 MW of new capacity over the next 10 years** (source: NEMMCO Statement of Opportunities).

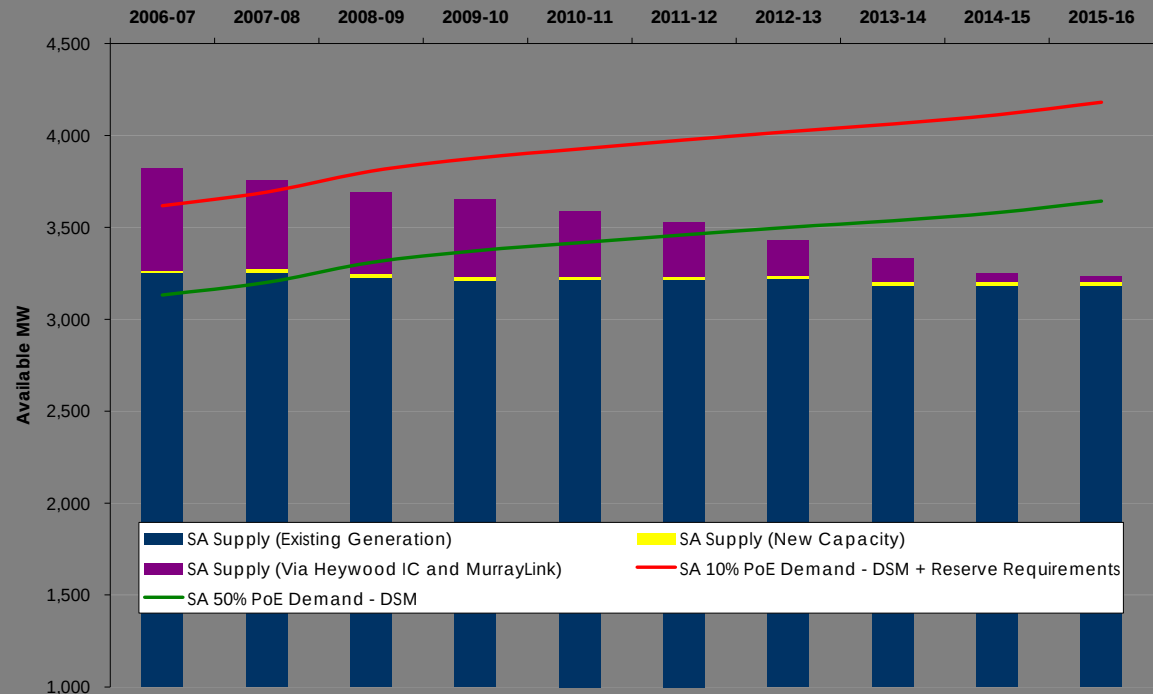
Australian Geothermal Licenses, Applications and License Application Areas



SA Electricity Market

- SA NEM region electricity demand to require at least 600MW of new capacity
- Does not include potential increase of over 400MW from Olympic Dam.
- Nor the effect of depleting Leigh Creek coal.
- Demand requirements will be between 600 – 1,500MW.

Forecast Supply
Demand Balance for
South Australia (source
SA ESIPC APR 2006)



SA Geothermal Projects

- Many players
- Large resources
- Exploiting different geothermal resources
 - Hot Rock plays
 - “Hot Water” plays
- Different market / connection plays

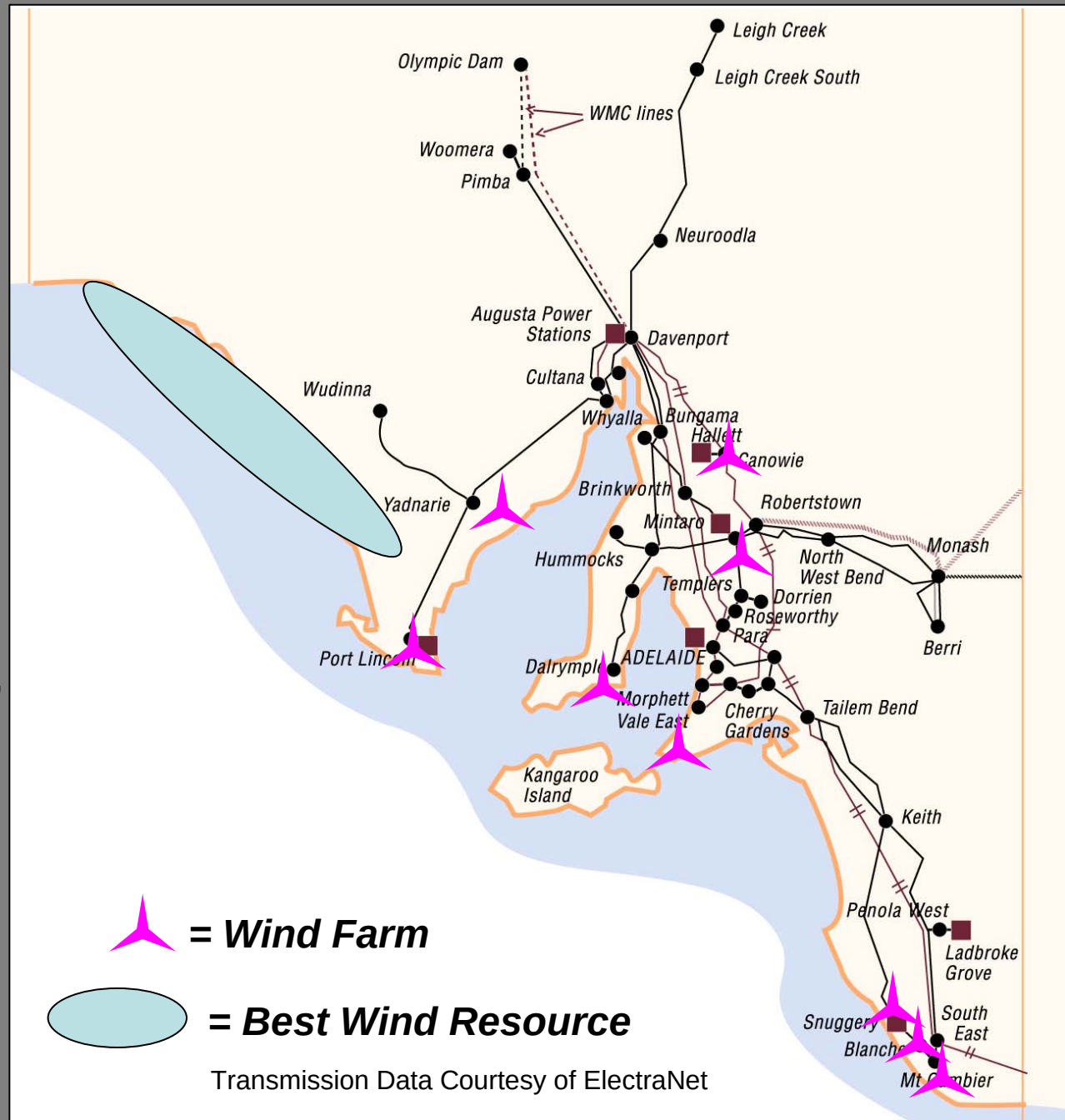


Geothermal Energy Project Economics

- Temperature (differential, quality and type of resource)
- Drilling Costs (depth, size, geological formation)
- Energy Flow Rates (volume, 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)

Network Access & Connection

- Transmission Costs
- Transportation losses
- Margin Loss Factor
- System Stability
- Development Approvals, Licensing, Easements and Permits
- Network Capacity at connection point



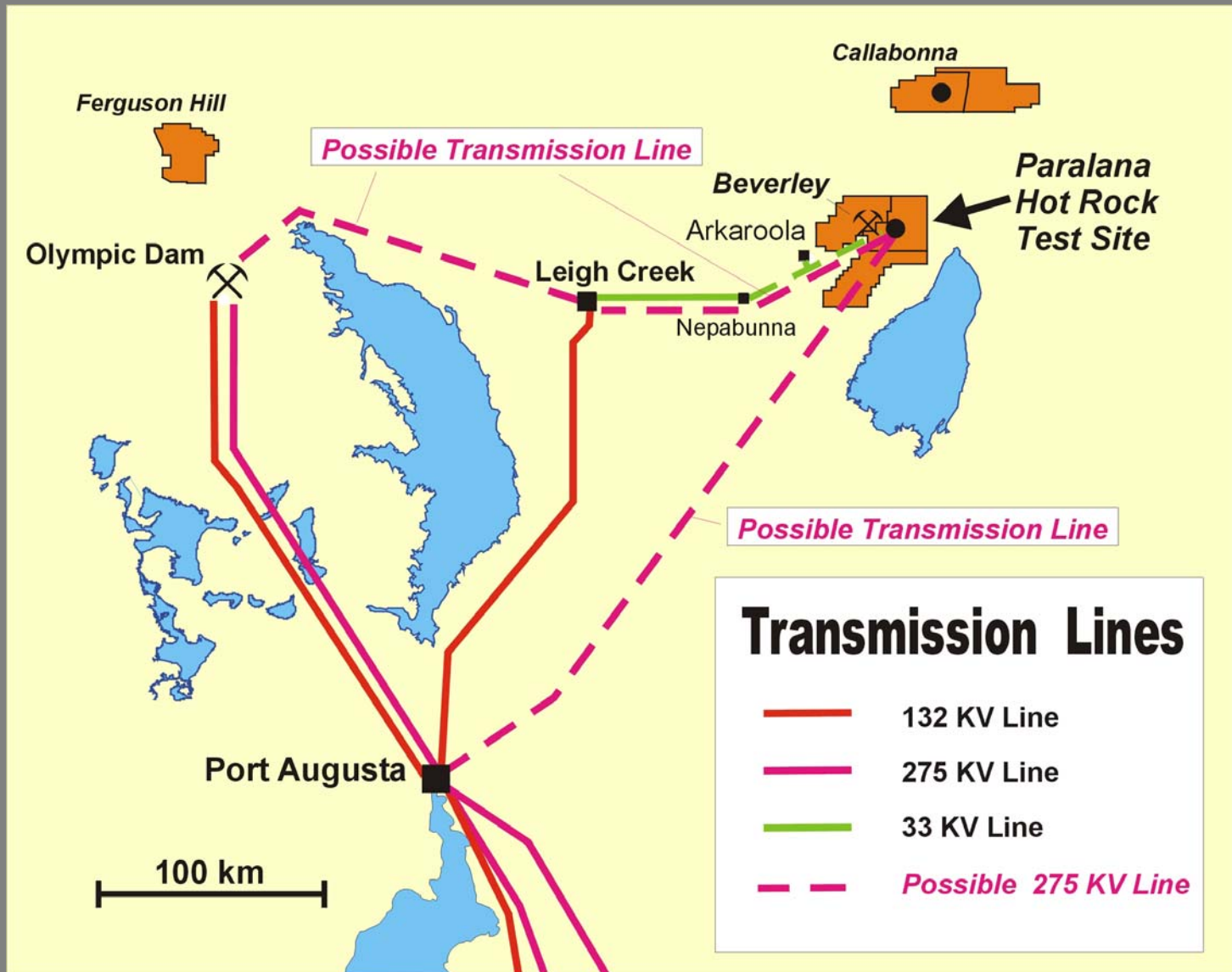
Electricity Market & Network Issues

- Proximity to market – network connection costs – 132kV or 275kV for large scale and/or distant locations
- Network Capital Costs – target around 10% to 15% of total project capital costs.
- Market constraints – local, regional, interstate transmission and market operations
- Marginal Loss Factors and Revenue
- Market – on-grid or off-grid pricing
- Development & Scaling Up
- New Entrant Pricing – SA combined cycle gas

Summary – Geothermal Energy Economics

- Geothermal Energy Projects have the potential to provide very cost competitive electricity generation
- The Australian NEM is competitive market but it is characterized by loosely interconnected regional markets – many constraints
- Economics of Geothermal can be clearly assessed but are very project specific – resource and location
- Project optimization process needed to deliver competitively priced product to market – LRAC c.f. New Entrant Price
- Costs include the cost of production, delivery (transmission) and sale to competitive market – “need to understand the market”
- Near term horizon – Geothermal requires a form of carbon pricing mechanism to be viable.

Paralana Commercialization Plan



Paralana Commercialization Plans

- Staged local expansion from 7.5 MW to 30.0 MW (from end 2009) – network capital costs range between 8% and 10% of total capital costs – uniquely positioned with a willing potential customer at “off grid” prices
- Realistic large-scale, long term plans over 15 years for 520 MW of power generation, incorporating market digestion, competition from geothermal/traditional sources and the cost of delivery to market (transmission costs) to the “on grid” market (NEM)
- Connection to the SA power system at Port Augusta and/or Olympic Dam, via a “meshed” 275 kV transmission network or individual double circuit 275 kV transmission lines - unique opportunity for meshed network community benefits leading to lower project costs.
- Competitive network capital connection costs range between 10% and 13% of total project costs (potentially as low as 5%)

Challenges for Australian 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.

Summary

- Petratherm's key strength lies in its approach to “exploration for heat” and its commercial assessment of projects – understanding the “three locations”.
- 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
- *Geothermal Energy – conventional and “hot rocks” can provide low cost, large scale, base load, renewable power - highly attractive political, economic, social and environmental global energy solution*

Thank You



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