



25 July 2011

Hot Rock Announces Maiden Geothermal Resource in Chile

- **Maiden geothermal resource of 7,400 PJ at Calerías project**
- **Equivalent to 185MWe generation potential**
- **Sufficient to power 250,000 local households**
- **Resource area remains open with strong indications for a significant extension**
- **Drill program planned for early 2012**
- **Resource results from the Longavi project are imminent**

Hot Rock Limited (ASX:HRL) is pleased to announce that a maiden resource has been estimated at its 100%-owned Calerías geothermal project located 100km south-east of Santiago, Chile (Figure 1).

Following the completion of geological, geochemical and geophysical studies, an inferred geothermal resource¹ of 7400PJ has been estimated for the project. The resource is equivalent to 185MWe of electrical power generation over a period of 30 years, sufficient to meet the needs of more than 250,000 Chilean households.

Dr Mark Elliott, executive chairman of HRL, commented, "This is a very significant milestone, positioning the Calerías project as our most advanced in the burgeoning, Chilean geothermal sector.

"Chile is one of the best regions in which to advance geothermal projects today. The country has some of the best volcanic geology suited for geothermal energy in the world, yet the sector is still in its infancy. Chile also has a very stable, pro-development government providing excellent incentives to new geothermal companies."

Chile, the world's largest copper producer, has the highest power costs in South America. The country has suffered power shortages for several years, due to increasing energy demand and drought. As such, there is both impetus and high potential to establish geothermal power there.

"We have had an on-the-ground presence in Chile since 2009. Our early mover advantage has allowed HRL to cherry pick several prime tenements, well before the recent pegging rush by the other major geothermal companies. HRL now holds the largest geothermal land package in Chile,

"Calerías is very prospective, being located near a volcanic centre providing heat. The project is also strategically located close to existing transmission grid inter-connection points with direct access to the large urban electricity market in Santiago and private customers such as the nearby El Teniente mine, the largest underground copper mine in the world. The El Teniente mine has a large future requirement for electricity, including power generated from renewable sources, required to meet obligations under recently revised government energy regulations.

"With a maiden resource now defined, we will expedite activities at Calerías with a view to start drilling by early 2012, upgrading the reservoir to a Measured Geothermal Resource suitable to commence a bankable feasibility study," Dr Elliott added.

¹ An "Inferred Geothermal Resource" is declared in conformance with Australian Geothermal Resource Reporting Code (2nd Edition, 2010) within a fractured volcanic geothermal system having deep temperatures estimated from spring chemistries of 230°C and possibly up to 250°C.

The Calerías resource area remains open with strong indications for a significant extension to the north-northeast. A further detailed geophysical survey is planned to commence by year-end, which should substantially expand the currently declared resource assessment ahead of drilling.

The Calerías resource assessment was undertaken within HRL by Peter Barnett and has been reviewed independently by Dr Subir Sanyal of GeothermEx, an international expert in geothermal resource and reserve estimation. GeothermEx is a highly regarded geothermal consulting and services firm located in the USA and now owned by Schlumberger. A copy of the GeothermEx’s review is attached. A summary of the HRL resource assessment report is detailed below and a more comprehensive version is available on HRL’s website.

Maiden resources at second Chilean project imminent

A maiden resource assessment is nearing completion at HRL’s next most advanced project, Longavi (100%-owned). Longavi is located 300km south of Santiago, close to transmission grid and markets.

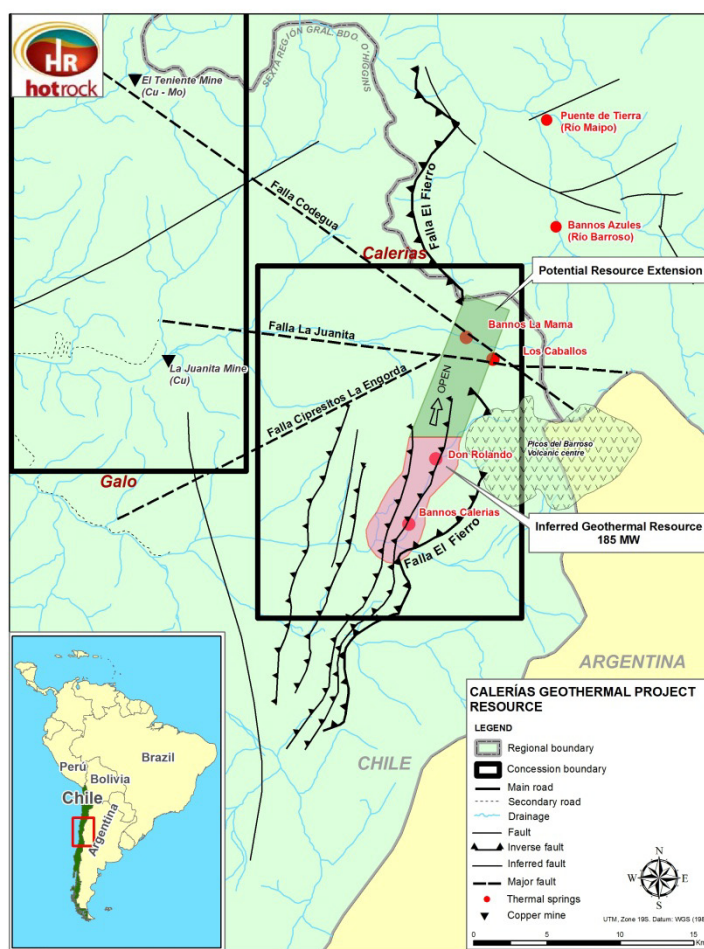


Figure 1: Location of the Calerías inferred geothermal resource

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Assessment of Calerías Geothermal Resource - Summary

An assessment of a geothermal resource within the “Calerías” geothermal concession in Region VI South-Central Chile is presented. It is the first resource assessment to be undertaken on Hot Rock Limited’s (HRL) geothermal projects in Chile and complements a number of similar resource assessments undertaken at HRL geothermal projects in Australia.

The assessment is based on a review of the key characteristics of the Calerías geothermal resource deduced from existing data and new field studies undertaken by HRL - in particular a recent 26 station magneto-telluric (MT) resistivity survey, the sampling and geochemical analysis of key hot springs in the area and detailed geological field investigations.

This work has allowed for the elaboration of the form and structure of a geothermal resource in the southern sector of the Calerías resource covered by the MT survey. The northern sector remains open pending further work. The results for the currently delineated resource areas are summarised in the conceptual resource model in Figure 2.

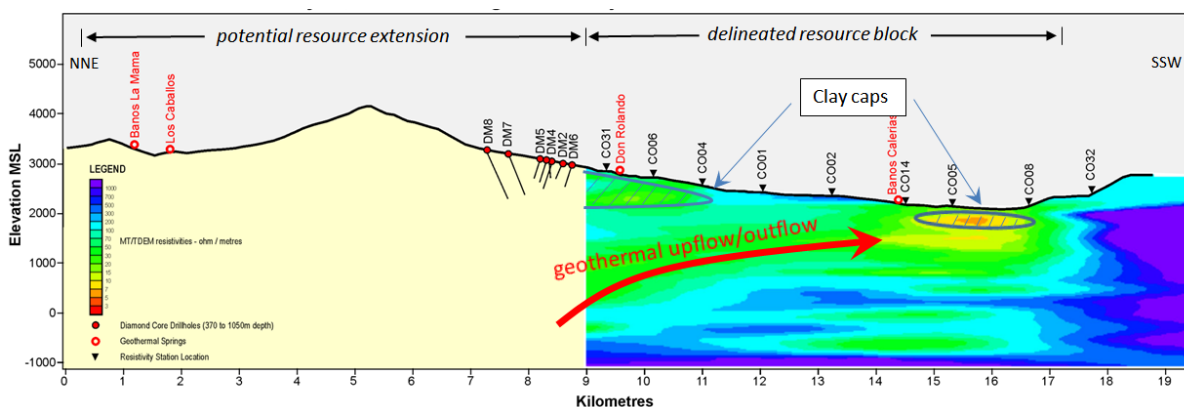


Figure 2: Conceptual hydro-geological model for the Calerías geothermal resource incorporating interpreted results of the MT survey. The southern resource sector is now confirmed. The resource potential associated with an extension to the north is yet to be confirmed, pending a further field program of MT measurements

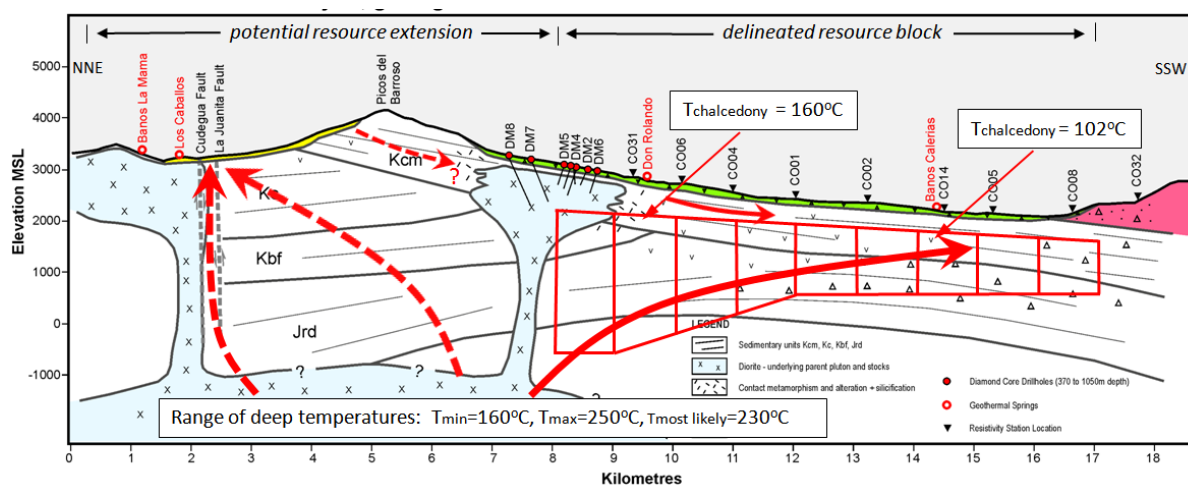


Figure 3: Calerías geothermal resource block model for calculation of stored heat in the Southern Calerías resource and the hydro-geological model, with estimated reservoir thickness obtained from MT data and reservoir temperatures assessed from geochemical methods

The resource model is consistent with the southern Calerías sector being an outflow from a deep geothermal reservoir that exists either beneath the area of the Don Rolando springs situated in the middle of the two figures, or towards the Baños La Mama springs further to the north. An additional MT survey will be undertaken next summer in the northern area to delineate this resource extension.

The temperature of the deep reservoir is assessed on present geochemical data to range between 160°C and 250°C, with a most likely temperature of 230°C. The in-place heat energy contained in the Inferred Resource has been assessed by a probabilistic Monte Carlo simulation method for the model shown in Figure 3. The results are summarised in Table 1 based on the various values and assumptions detailed in Table 2.

The size of the Inferred geothermal resource identified in the southern sector of Calerías is estimated at a P50 level of probability to have a volume of 44 km³ and to contain an estimated 7,400 PJ of in-place heat energy (Table 1).

Table 1: Summary of resource assessment results

Resource Name	Resource Type	Resource Classification	Resource Volume (km ³)	In-place stored heat (PJ)	MWe
			<i>(at P50 level of probability)</i>	<i>(at P50 level of probability)</i>	<i>(at P50 level of probability)</i>
South Central Calerías	Volcanic	Inferred	44	7,400	185

The amount of electricity that could potentially be generated from a geothermal resource of this size depends critically on the amount of heat that can be recovered from the resource, the type of power plant utilised at the surface to convert the geothermal heat into electricity and the thermal efficiency for the conversion process.

Based on the values of these parameters and a number of other variables, defined in Table 2, it is assessed that for a recovery factor of 15% and a power plant thermal efficiency of 14% operating with a capacity factor of 90%, the geothermal resource of 7,400 PJ at Calerías would be sufficient to support a 185 MWe geothermal power plant for a period of 30 years. It is assumed in this assessment that an Organic Rankine cycle power plant would be utilised rather than steam plant. In practice, a combination of both plants would be more likely.

HRL expects to refine and increase the magnitude of the present resource assessment over the next 6 to 12 months through the following:

- A further detailed MT survey to delineate the northern extension of the currently identified resource indicated to exist at least as far north as the La Mama springs and possibly beyond. This additional resource may prove to be of a similar size to the inferred resource identified and estimated here. The additional MT work will be undertaken in late 2011 in the NE resource area after which an update to the current resource assessment can be anticipated;
- Inclusion of results from work currently in progress for evaluating geothermal resource conditions encountered in eight core holes drilled from 350 to 1000m depth by an international mineral company in the central area of the Calerías geothermal resource;
- Subsequent deep exploration drilling at Calerías by HRL which will allow for temperature measurements to be made directly within the geothermal reservoir at depth and this may result in higher temperatures being realized than have been

assumed in the estimate here and may also allow for the depth of “reasonably recoverable” resource (as defined under the Australian Reporting code) to be extended beyond that inferred here.

HRL expects to commence exploration drilling at Calerías in 2012 after which a further update to the resource assessment will be made based on temperatures measured in wells that penetrate into the geothermal reservoir. This will allow for an improved declaration of the resource assessment as “Measured Resource” in place of “Inferred Resource”.

- **Table 2: Parameters used in the Monte Carlo simulation assessment of the geothermal resource located in the central-southern area of Calerías and other assumptions**

Parameter	Units	Most Likely Value	Probability Distribution		
			Type of Distribution	Min	Max
Variable Parameters:					
Resource area	km ²	100%	Normal	90%	110%
Resource thickness	km	100%	Normal	80%	110%
Porosity	%	15%	Triangular	10%	20%
Reservoir temperature	°C	230	Normal	160	250
Recovery factor	%	15%	Triangular	12%	20%
Conversion efficiency	%	14%	Triangular	12%	15%
Fixed Parameters:					
Rock specific heat	kJ/kg°C	0.9	Constant		
Rock density	kg/m ³	2600	Constant		
Minimum geothermal	°C	120	Constant		
Resource cut-off temperature	°C	70	Constant		
Plant Capacity factor	%	90%	Constant		
Plant life	Years	30	Constant		

Statement by Competent Person

The information in this Statement that relates to Geothermal Resources has been compiled by Peter Barnett, an employee of Hot Rock Limited.

Mr Barnett qualifies as a Competent Person as defined by the Australian Code of Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves (2nd Edition, 2010).

He has over 30 years’ experience in the determination of crustal temperatures and stored heat for the style relevant to the style of geothermal play outlined in this release. He is a member of the Geothermal Resources Council and the International Geothermal Association, a current board member of the New Zealand Geothermal Association, a current member of both the Economics and the Geothermal Resource Code Reporting Code sub committees of the Australian Geothermal Energy Association (AGEA) and a past board member of the Auckland University Geothermal Institute Board of Studies.

In this work Mr Barnett has drawn freely from reports on the Calerías geothermal resource prepared under his supervision, by both staff of HRL and by external consultants. The estimation on in place has been undertaken directly by Mr Barnett. Mr Barnett consents to the public release of this report in the form and context in which it appears. Neither Mr Barnett nor HRL takes any responsibility for selective quotation of this Statement or if quotations are made out of context.



■ **Figure 4:** *Baños Longavi hot springs, Calerías geothermal project*



■ **Figure 5:** *Don Rolando hot springs, Calerías geothermal project*

About Hot Rock Limited

Hot Rock Limited is a geothermal energy company that offers investors an opportunity to participate in socially responsible and ethical investment choices through the development of sustainable, emission-free, base load power generation. Strategically, HRL has elected to focus on the commercially proven Volcanic Geothermal and Hot Sedimentary Aquifer (HSA) type projects in its quest to become a leading supplier of geothermal power.

In Australia, the company is focused on developing HSA projects in its large Otway Basin tenements in south west Victoria. The flagship Koroit project is ready to drill and test and is awaiting the outcome of ongoing discussions with the Federal government and potential joint venture partners to fund this project.

HRL has expanded internationally via South America with the establishment of offices in Santiago and Lima in 2009. Exploration applications covering exciting volcanic prospects in Chile and Peru are being granted and exploration has commenced. HRL is consolidating its position in South America, where high quality geothermal resources exist and attractive regulatory environments and market conditions are present.

Attachment:

Review of HRL Calerías Resource Assessment Report
by Dr Subir Sanyal, GeothermEx, San Francisco

Mr. Peter Barnett,
Managing Director
Hot Rock Limited
Level 5, 10 Market Street
Brisbane, Australia 4000

July 22, 2011

via email: Peter.Barnett@hotrockltd.com

Subject: Review of “Assessment of Inferred Geothermal Resource: Calerías Project, Chile”

Dear Mr. Barnett

We have reviewed the subject report, Issue 1, June 2011, prepared by Hot Rock Limited (“HRL”) and have also reviewed several email and telephone conversations between ourselves and you, regarding the contents and conclusions therein. This review leads us to the following relevant conclusions regarding the subject resource:

- The subject report presents a comprehensive and competent assessment of the geothermal resource that is inferred to exist in the subject concession area, relative to the amount of resource information and data that are available at the current stage of exploration of the subject project.
- An essential component of the inferred resource model is the idea that the subsurface of the area includes relatively young intrusive rocks that have been emplaced into the Picos del Barosso Quaternary volcanic complex, under the control of structures (such as folds, faults and fractures) that have developed on a regional scale. The cooling of these intrusive rocks is the inferred source of heat for the geothermal resource. The Picos del Barosso Quaternary volcanic complex is not described or documented in detail. However, given the regional setting of the concession area, at the northern end of the Southern Volcanic Zone (SVZ) of Chile, we consider this to be a reasonable working model.
- A second essential component of the inferred resource model is the use of the chemical analysis brine from thermal spring to estimate temperatures at depth. Within the concession area there are three thermal springs and possibly a fourth (recently discovered during a fly-over). Chemical analyses are available for: (i) Baños La Calerías (62°C), (ii) “Don Rolando spring” (67°C) and (iii) Baños La Mama (37°C). Chemical geothermometry is a well-established geothermal exploration method. Thermal spring chemistry is controlled by hot water-rock reactions at depth and the chemical reaction

rates decrease with cooling. The alterations of water chemistry that tend to occur during ascent of the water to the surface are limited and differences between different geothermometers can actually supply inferences about the cooling history, unless it has been overly disrupted by mixing with cool, near-surface ground waters. The three hot springs are chemically similar one-to-another. All three are a sodium-potassium-chloride (Na-K-Cl) type that is commonly associated with geothermal activity at depth. Differences between the springs (for example, chloride (Cl) concentration range from 3580 to 4565 mg/L) are probably a result of mixing with cool, dilute ground waters (data from Las Calerías indicate this) and perhaps also a result of boiling at depth (postulated). A low ratio Na/K and elevated silica (SiO₂) are each commonly a geothermal signature, although both instead could result from low-temperature processes. Calcium (Ca) and magnesium (Mg) concentrations are somewhat elevated, and this could be a result of cooling, of incomplete heating, or of mixing with a cool, saline component. Some (at least) of the springs are actively depositing calcium carbonate (which indicates somewhat low temperatures) but have also deposited silica (which would imply particularly high temperatures). The spring data taken together are somewhat ambiguous. The “silica” geothermometers imply that a reasonable lower boundary to conditions at depth is about 154°C at the “High CO₂” spring and about 120°-130°C at the other two springs. The upper boundary that is suggested by various cation ratios could be as low as 195°C but also could exceed 300°C. HDR has inferred an upper boundary of 250°C, and we consider this to be a reasonable condition at affordable drilling depth, so long as the heat is indeed supplied by young, shallow intrusive rocks.

- A final important component of the inferred resource model is the pattern of conductivity and resistivity at depth in the southern sector of the concession, measured by an MT (magneto-telluric) resistivity survey. This survey had limited coverage and the measurement points (stations) were too few in number and too spread-out to allow a confident interpretation of the data using the so-called “3D” inversion of the data. The results of a simpler “1D” inversion show low resistivity trends that can be attributed (without proof) to hydrothermal alteration at depth, particularly in the vicinities of the hot springs, with partially isolated hydrology in-between. Most particularly, there is a conductive trend at depth that appears to connect the area of the “High CO₂” hot springs with some mining core holes that lie just north of the survey area. It is reported that the core holes produced hot water, but specifics are not available. The resistivity discovery has led HDR to plan an extension of the MT survey northwards, during the next field season.
- Based on the inferred model of the geothermal resource as outlined above, and gridding of the stratigraphy and temperature, HRL has conducted volumetric estimation of the

stored heat in the geothermal system using a probabilistic approach (Monte Carlo simulation). This estimation methodology is a generally accepted practice in geothermal industry, and is one of methodologies described in the Lexicon of the Australian Geothermal Reporting Code (Edition 1, 2008).


- We find the details of the resource assessment methodology and parameter estimates presented by HRL are appropriate given the resource model and parameters referred to above. Furthermore, based on our knowledge of the Australian Geothermal Reporting Code (2008), our experience in geothermal resource estimation in many projects in Chile, and our familiarity with similar geothermal fields in Turkey and the United States we have conducted for various geothermal developers, we confirm that the resource classification used by HRL in their report adheres to the letter and spirit of the Code.
- Although we have not conducted an independent probabilistic estimation of resource for the Calerias project, we concur with the assessment by HRL that the South Central sector of Calerias has a resource volume of 44 cubic km and an Inferred Resource of 7,400 PJ, equivalent to 185 MWe of electrical power capacity for a 30-year project life.
- HRL expects to refine and increase the magnitude of the present resource assessment in the near future through:
 - (a) undertaking a further detailed MT survey to delineate the northern extension of the currently identified resource ;
 - (b) inclusion of results from work currently in progress for evaluating geothermal resource conditions encountered in eight core holes drilled from 350 to 1000m depth by an international mineral company in the central area of the Calerias geothermal resource; and
 - (c) subsequent deep exploration drilling at Calerias to be carried out by HRL.

We believe these are reasonable next steps to take and should allow declaration of the resource assessment as “Indicated Resource” rather than “Inferred Resource”.

- We understand that the HRL report has been prepared under the supervision of Mr. Peter Barnett, a fulltime employee of HRL. We note that Mr. Barnett is a Competent Person as per the guidelines of the Australian Geothermal Reporting Code (Edition 1, 2008). The undersigned would like to state further that he has professionally known Mr. Barnett for

more than 30 years and has complete confidence in his technical competence and professional judgment.

Sincerely yours,
GeothermEx, Inc.



Subir K. Sanyal, Ph.D
President

About GeothermEx:

GeothermEx (a Schlumberger Company) is a geothermal energy consulting and service company based in California that has provided services in 55 countries since 1973. It has been associated with the development of more than 7,000 MW of electric power capacity and has conducted due diligence for financing of nearly U.S. \$13 billion to date.