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## **HOT ROCK EXPANDS GEOTHERMAL PORTFOLIO IN EMERGING SOUTH AMERICA MARKETS**

### **Two new tenements in Peru granted**

Hot Rock Limited (ASX: HRL) is pleased to announce the expansion of its geothermal exploration portfolio in South America, with the granting of the Chocopata and Quella Apacheta geothermal tenements located in Southern Peru (**Figure 1**).

With these awards, Hot Rock now holds three granted tenements in Peru, to complement the company's eight tenements in Chile. Five more Peruvian tenement applications remain in the final stages of processing and are expected to be granted within the next few months.

Both the Chocopata and Quella Apacheta tenements are conventional volcanic geothermal heat sources, which have associated surface hot springs with temperatures recorded up to 90°C and with extensive surface silica sinter deposits. This field evidence highlights the excellent prospectivity of these tenements for the proving of geothermal reservoirs suitable for electrical power generation.

Community consultation and land access programs are underway at both tenements and detailed geoscientific surface exploration surveys will be soon commenced.

Southern Peru offers both attractive infrastructure and electricity markets for geothermal power development. High voltage transmission lines occur within 70km of the tenement boundaries, allowing electricity sales into the National electricity grid or private industrial users and copper mines.

The electricity market in Peru was privatised in 1990's and demand for electricity has increased substantially to keep pace with the high levels of development in manufacturing and mining reflected in Peru's GDP growth in 2010 of 7%. A recent report from the grid operator COES highlights that annual energy and capacity demand in the next 10 year period will grow 6.2% to 75TWh and 10,500MWe, respectively. This will require that the electrical generation capacity of Peru be doubled over the next 6 years.

Peru currently relies on fossil fuel (52%) and hydro-electric (48%) plants for its electricity. Continuing drought is negatively impacting on electricity generation from its hydro-electric plants. In an effort to reduce Peru's reliance on fossil fuels and hydro-electric technologies, the Peruvian government is vigorously supporting the development of renewable energy, including geothermal energy. Introduced legislation offers renewable energy sources incentives such as favourable electricity tariff mechanisms, tax benefits and priority of connection to the grid and electricity sales.

Hot Rock’s Executive Chairman Dr Mark Elliott said, “Hot Rock is taking advantage of its pioneer mover status in Peru, as highlighted by the early granting of the highly prospective conventional volcanic geothermal tenements at Chocopata and Quella Apacheta. With each additional tenement, the company significantly reduces development risk and increases the opportunity of discoveries in future exploration programs leading to potential development of geothermal power generation in Peru.

“The Peruvian government supports the development of geothermal energy, through legislation that provides a mechanism for setting feed-in tariffs, tax incentives and guaranteed connection to the grid and sale of all power produced. Given the quality of Hot Rock’s projects and experienced management team, the company is in an excellent position to benefit from these incentives by commercialising geothermal energy in Peru.”



**Figure 1:** Locations in Peru of geothermal tenements granted to HRL (red) and tenements still in process (green)

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## About the Chocopata and Quella Apacheta Geothermal Projects

The **Chocopata** tenement is located in Lampa Province in Southern Peru, some 120km north-east of the city of Arequipa and 90km north-west of Puno. It comprises a land area of 170km<sup>2</sup>.

Geologically the area lies between the Andean Volcanic Belt and the Altiplano plateau. The volcanic complexes of Sollipaca and Turputa are located inside the tenement area.

The main thermal area of Pinaya is located close to the southern edge of the Chocopata tenement and is characterized by numerous surface hot springs with temperatures ranging between 40 and 90°C. Two further thermal areas have been so far identified within the tenement area, at Quebrada Jarpaña and Chupahuito. The Quebrada Jarpaña, springs have measured temperatures above 50°C with active deposition of silica which indicates high fluid temperatures in a geothermal reservoir at depth. Chupahuito, located north of Jarpaña, has hot springs with measured temperatures exceeding 60°C.

The tenement is flanked to the north, east and west by three 138kV electricity transmission lines. The geological setting, the quality of the surface thermal activity and the proximity to the national electricity grid, highlight the excellent prospectivity of this tenement.

The **Quella Apacheta** tenement covers 125km<sup>2</sup> and is located 100 km south-east of Arequipa and 60 km north-east of the city of Moquegua. Geologically, Quella Apacheta is in the Andean volcanic belt on the northwest flank of the Ticsani Volcano.

The tenement lies 13km east of a 220kV transmission line and a separate 138kV transmission line passes through the tenement. Additionally, the tenement is located close to three major copper mines Cujones (30km distance), Quellaveco (40km) and Toquepala (50km), providing the opportunity for future direct sales of electricity to these large industrial customers.

At least four fumaroles and hot springs are located close to the top of the Ticsani volcano. These confirm an active geothermal system to be associated with the volcano. Thermal features around the basal periphery of the Ticsani volcano consist of at least 12 chloride bicarbonate springs with discharge temperatures ranging between 54 to 89°C, also with silica sinter being actively deposited (**Figure 2**).



**Figure 2:**  
*Hot Rock geoscientist undertaking geochemical sampling at an area of surface activity at the Quella Apacheta geothermal prospect in Southern Peru*

One group of these springs provides a spectacular display in which a high flow rate of boiling geothermal water is continuously discharging to the surface under substantial artesian over-pressure (**Figure 3**). The thermal output from this natural discharge feature is equivalent to that from a small commercial geothermal well.

Cation geothermometry calculations carried out on chemical analyses of geochemically mature spring waters in these peripheral locations in the Quella Apacheta geothermal system yield estimates of subsurface reservoir temperatures within the deeper reservoir of at least 230°C.

The Quella Apacheta tenement shows all the characteristics of classical high temperature volcanic geothermal systems elsewhere in the world and is therefore highly prospective for commercial development. Once explored, drilled and characterised it may prove that that Quella Apacheta will become the archetype for Andean volcanic geothermal systems.



**Figure 3:** *Highly over pressured artesian surface discharge of boiling geothermal spring water at Hot Rock's Quella Apacheta geothermal tenement in Southern Peru*

## 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 Hot Sedimentary Aquifer (HSA) and Volcanic Geothermal 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. In August 2010, HRL was awarded a Geothermal Drilling Program (GDP) grant for \$7million from the Australian government. The grant funds are to go toward the drilling program of HRL's maiden flagship geothermal project at Koroit in the Otway Basin, starting in 2011.

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.