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## World's largest integrated geothermal company EDC and Hot Rock sign major Joint Venture

### Path now paved for development of four advanced South American geothermal projects

#### HIGHLIGHTS

- Energy Development Corporation (**EDC**), the world's largest steam and plant geothermal company, has signed binding joint venture agreements covering four of Hot Rock's (HRL) projects, two each in Chile and Peru, with the agreements covering funding of each project up to financial close.
- Following transfer of tenements to the project companies, HRL will receive an initial \$US2.5m cash payment and a further \$US1.5m subject to certain conditions.
- EDC will acquire a 70% interest in each project company and will sole fund the exploration stage up to \$US12m per project. The total expenditure for sole funding of the four projects is up to \$US48m.
- In the subsequent resource development stage, EDC (70%) and HRL (30%) will contribute to the joint venture for each project on a pro-rata basis. HRL can contribute its own funds or request EDC to advance a loan to HRL to fund evaluation and production drilling through to securing project finance (**financial close**) for each project. The estimated cost of the evaluation stage for each project is in the order of \$US38m.
- If all projects proceed from exploration stage to financial close, an estimated total of \$US200m could be spent over four projects.

Hot Rock Limited (**HRL**) is pleased to announce that it has executed binding joint venture agreements with Energy Development Corporation (**EDC**), the world's largest integrated geothermal company, to joint venture four South American projects.

The agreements enable EDC to become the majority partner of the Calerías and Longavi projects in Chile and the Quellaapacheta and Chocopata projects in Peru.

Hot Rock Executive Chairman, Dr Mark Elliott stated: "EDC's involvement is a huge endorsement to both the quality and blue-sky potential of our Chilean and Peruvian projects and local exploration teams".

"We could not have hoped for a better partner than EDC, given their vast expertise, experience and track record of success in developing geothermal projects from exploration through to commercialisation and operation".

“Of note, the deal will allow the company to focus on advancing several of its remaining 100%-owned projects in Chile and Peru through to resource definition in 2012, whilst concurrently accelerating development at the four most advanced projects via the joint venture.”

The Chile and Peru joint venture agreements formalises the Heads of Terms signed by the two companies on 28 November 2011. Under the joint venture agreements, EDC will sole fund up to \$US12m for each project over the exploration stage which includes geological, geochemical, geophysical surveys and at least drilling one production appraisal well. Exploration programs will commence in early 2012 with EDC mobilising their own magneto telluric (MT) equipment and teams from the Philippines to Chile in the next few weeks to select drill targets.

EDC will make payments to HRL of \$US2.5m when the project tenements are transferred into the newly formed joint venture companies. EDC will then acquire a 70% interest in the projects and be responsible for sole funding the exploration stage of each project up to \$US 12m. EDC will make further payments of \$US1.5m to HRL subject to certain conditions being satisfied, including certain Government renewals and approvals taking place.

Following the completion of the sole funding stage, the subsequent resource development stage involves completing production drilling and testing, a definitive feasibility study, environmental impact study, power contract(s) and securing project financing. The successful completion of all these activities is expected to bring the projects to financial close. EDC estimates that around 50% of the steam requirement for a proposed geothermal plant will need to be tested and available at wellhead to secure project financing or financial close.

Under the joint venture agreements, HRL will maintain its 30% stake if it contributes its pro-rata share in funding the additional resource development costs, estimated at US\$ 38m. If HRL does not contribute any funds during the additional resource development stage it can still elect to retain an 18% minimum project interest at financial close by repaying EDC 18% of the additional resource development costs (plus a finance charge).

After completion of the exploration stage, the estimated cost of completing the resource development stage, including drilling and testing of a further five production wells for each project, is in the order of \$US38m for a project designed for a plant capacity of around 50MWe. If all four projects proceed to financial close, the joint venture could spend up to \$US200m.

Dr Elliott added, “These joint ventures allow HRL to participate in its first four projects through to potential development, including the production well drilling (of 50% of the production steam requirement for the proposed 50MWe development per project), required to complete the project financing stage prior to proceeding with construction. This is a significant achievement, given that both drilling and financing risk has severely hampered the domestic geothermal industry for the past three years”.

The initial cash contribution of \$US2.5m by EDC is payable when the project tenements are transferred into the newly formed joint venture companies. These funds plus the company’s current cash enables HRL’s wholly owned projects to be fully funded for the current 2012 exploration program.

“This is another huge step forward in the growth opportunities and realising HRL’s ambition of becoming a major geothermal power generator.”

Richard Tantoco, President and COO of EDC today praised HRL by stating that it “...had acquired 23 granted geothermal tenements across Chile, Peru and Australia. With an experienced and accomplished geothermal team, the company has been among the first to identify and obtain some of the most attractive concession areas in Latin America.”



*File Photo: Richard Tantoco, President and COO of EDC and Mark Elliott, Executive Chairman of HRL at a signing ceremony*

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### **About Energy Development Corporation**

EDC (PSE: EDC) is the world's largest integrated geothermal company with a total of 1,130MWe of installed capacity with over 35 years of operational geothermal experience supplying the Philippines with geothermal power across five steam fields. EDC is a public company with a market capitalisation of around US\$2.4 billion. The World Bank-International Finance Corporation (WB-IFC), Government of Singapore Investment Corporation (GIC) and First Gen are key investors and continue to support the company. EDC has met all the WB-IFC and GIC operational, environmental and social impact performance standards.

EDC owns 8 drill rigs and has drilled more than 900 geothermal wells over the past 35 years. It has one of the most experienced geothermal operations team in the world and has embarked upon an aggressive global growth strategy to build its geothermal business.

EDC recognised the importance of high quality under-explored geothermal prospects in South America by setting up a Chile office in 2011.

### **About the Projects**

#### **Calerías Project - Chile**

Calerías is located 100km south east of Santiago and covers three tenements (Galo, San Carlos and Calerías). The project lies immediately to the east of the El Teniente copper mine – the largest underground copper mine in the world - and is close to the large commercial electricity market in Santiago.

The prospect shows six groups of thermal springs with discharge temperatures averaging 50 to 60°C

and ranging up to 75°C. The temperature of the deep geothermal reservoir at Calerías is assessed on present geochemical data to range between 160°C and 250°C, with a most likely temperature of 230°C.

A magneto-telluric (MT) geophysical survey, carried out by HRL in early 2011, defined part of a large geothermal system and provides the basis for a geothermal resource estimate. The resource is estimated to be sufficient to allow for at least 185MWe of electrical power generation for 30 years. The boundary of the resource remains open to the north and it is expected that further MT work in this area will increase resource size. Key assumptions underpinning the current resource estimate include: a reservoir recovery factor of 15%, a power plant thermal to electrical efficiency of 14% and a power plant operating capacity factor of 90%.

### **Longavi Project – Chile**

The Longavi project consists of four contiguous tenements, located 300km south of Santiago, on the southern and south-eastern slopes of a large basaltic-andesite strato-volcano named Nevado de Longavi.

A number of large flows of near boiling springs in the Banos Longavi area occur in the centre of the project. Spring temperatures range from 70°C to 81°C and a surface heat flow in the area of the springs of some 15MWthermal has been assessed. The springs show good field evidence for having historically been depositing silica sinter from boiling spring waters, an excellent indication of high subsurface geothermal temperatures. The presence of these impressive thermal features over a large surface area and the close alignment of them with surface faults, indicate that the geothermal system at Longavi may be substantial. Based on present geochemical data, the “most likely” estimate of deep reservoir temperature is 180°C, with a “possible maximum” of 220°C.

A MT survey was completed over the project in early 2011 and identified a resource “upstream” from the Banos Longavi springs. A detailed resource assessment study indicates the Longavi resource is sufficiently large to allow for about 135MWe of electrical power generation over a period of 30 years, based on the key assumptions of: a reservoir recovery factor of 15%, a power plant thermal to electrical efficiency of 14% and power plant capacity factor of 90%. It is expected that further MT survey and future drilling will increase this estimate substantially.

### **Quellaapacheta – Peru**

The Quellaapacheta exploration tenement is located 120 km north of Tacna, near the town of Calacoa along the Putina River in the province of Moquegua in Southern Peru. The project is associated with the Ticsani Volcano in the Peruvian Southern Cordilleran Volcanic Zone.

Steaming ground and fumaroles have recently been discovered by Hot Rock on the upper flanks of the Ticsani volcano. At least fifteen hot springs occur at lower elevations along the Putina and Cuchumbaya rivers, tributaries of the Rio Tambo. These range in temperature from 54°C to 89°C with pH's ranging from 5.8 to 8.3. In geochemical terms the springs are described as mixed chloride-bicarbonate waters indicating the presence of a benign geothermal reservoir at depth. Carbonate and silica sinter deposition products occur around the lower elevation thermal features.

The presence of chloride-rich water actively depositing silica sinter at low elevations and fumarolic activity at higher elevations confirms that Quellaapacheta is a classic steep terrain, high temperature geothermal volcanic system. Deep temperatures in this system are indicated from geochemical considerations to be at least 240 C.

## **Chocopata – Peru**

The Chocopata exploration tenement is located 120 km north-east of Arequipa and 100km north west of Puno. The tenement is flanked north, east and west by three 138 kV transmission lines, all located about 70 km from the centre of the tenement.

The main thermal area at Chocopata is called Pinaya and is located close to the southern edge of the tenement. This is characterized by numerous hot springs with temperatures ranging between 40 to 90° C and with pH's ranging from 5 to 6. The Pinaya hot springs have a substantial flow rate estimated at 10 l/s. Temperatures in an underlying geothermal reservoir of hot primary geothermal water are expected from geochemical considerations to be over 210°C.

Similar to Quellaapacheta, the occurrence of a primary chloride reservoir with indications for high reservoir temperatures suggest that Chocopata is a classic steep terrain, high temperature geothermal volcanic system.

Overall, the geological setting, the strong surface geothermal activity and the proximity of the projects to the national grid highlight the excellent prospectivity of the Chocopata project.

## **About Hot Rock Limited**

Hot Rock Limited (ASX: HRL) 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. 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 into South America where high quality geothermal resources and attractive regulatory environments and market conditions are present. The Company established offices in Santiago and Lima in 2009. Exploration tenement applications covering exciting volcanic prospects have been granted to Hot Rock in both countries and exploration is now well advanced at a number of these tenements. Energy Development Corporation (EDC), the largest integrated geothermal company in the world has entered into a joint venture with HRL to fund two projects in Chile and two projects in Peru.