Geothermal Development in Chile
Country Update

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Geothermal Development in Chile Country Update

Content of the presentation

- Energy situation in Chile
- Development possibilities of the geothermal energy
- Current development of the geothermal energy
Local energy resources provide about 27% of the total consumption.

www.cne.cl
More than 90% of fossil fuels are imported.
Electricity Market in Chile

It consists of two main large independent systems

• One is the **Northern Interconnected System (SING)**

  Installed Capacity (CNE 2011)

  - Fossil Fuels : 3,949 MWe
  - Hydro : 14.9 MWe
  - Total : **3,963.9 MWe**

  Gross Production : 15,881.2 GWh/yr

  Average cost of electricity : **US$120/MWh** (CDEC 2012)

  Major clients of the SING are large copper mines: e.g., Chuquicamata-240 MW, Escondida-200MW, Doña Inés de Collahuasi-122 MW, representing 90% of the total power demand

www.cdec.cl
Electricity Market in Chile

- The other is the **Central Interconnected System (SIC)**

  **Installed Capacity** (CNE 2011)

  - Hydro : 5,858.8 MWe
  - Fossil Fuels : 6,309.6 MWe
  - Wind : 196.7 MWe
  - **Total** : 12,365.1 MWe

  **Gross Production**: 46,052.3 GWh/yr

  **Average cost of electricity**: US$ 105-110/MWh (CDEC 2012)

  This system provides electricity to 90% of the population.
Immediate Challenges

Opportunities

• Chile has abundant renewable energy resources

• Electrical capacity needs to be increased at least by 800 MW/year

• Growing awareness of the global effects of CO$_2$ emissions

• The mining sector needs to reduce its carbon footprint

Problems

• Widespread public opposition to large coal-fired or large hydro power plants

• The fact that power companies always try to develop electricity projects with low initial investment
The Case for Geothermal Energy in Chile

• The Chilean Government is actively promoting the development of renewable energy

• Chile has all the components for a successful, dynamic geothermal industry

• There exists well-defined geothermal legislation

• Chile has over 10% of the world’s active volcanoes

• The country has many attractive prospects associated with more than 300 hot-springs areas
The subduction of the oceanic Nazca and Antarctic Plates under South America accounts for the tectonism and magmatism of the Andean Margin.

Active volcanism is segmented into two main volcanic zones: the Northern Volcanic Zone and the Central-Southern Volcanic zone.

The segmentation of the volcanic arc is controlled by the dip and morphology of the Benioff zone.

The geothermal activity is spatially associated with the Quaternary volcanism.
Current geothermal development in Chile

At present there are

- 69 geothermal exploration concessions throughout the country and,
- 5 geothermal exploitation concessions

The thermal areas of these concessions are being studied by the following companies

- Empresa Nacional de Geotermia S.A
- GeoGlobal Energy Chile SPA
- Hot Rock Chile S.A
- Colbún S.A
- Infinergeo SPA
- Ormat Andina Energía Ltda
- Magma Energy Chile Ltda
- Origin Energy Chile S.A
- Energy Dev. Corp. Chile Ltda
- Minera Saldivar Ltda
- Minera Escondida Ltda
- Minera Collahuasi
- Energía Andina S.A. (AM-Origin)

(www.minenergia.cl/)
Northern Chile Geothermal Zone (17°30’ – 28° S)

- About 90 hot-springs areas are located within this zone.
- Geological and geochemical reconnaissance studies have been completed in most of them.
- 42 exploration concessions are being surveyed.
- The most advanced exploration correspond to: Colpitas, Apacheta, Pampa Lirima and El Tatio-La Torta geothermal areas.
- Slim holes have been drilled in these 4 areas.
- Exploitation concessions have been granted to Apacheta and El Tatio-La Torta projects, where production wells have been drilled.
Apacheta (Cerro Pabellón) Project

The environmental impact assessment for the installation of a 50 MW geothermal power plant has been approved.

The project belongs to Empresa Nacional de Geotermia S.A. (ENEL-ENAP)
Central-Southern Chile Geothermal Zone (33° – 46° S)

- There are more than 200 hot-springs areas in this zone
- Preliminary geological and water geochemical studies have been made in most of these areas
- 27 exploration concessions are being surveyed
- The most advanced surface exploration studies have been done at Tinguiririca, Calabozos, Laguna del Maule, Chillan and Tolhuaca
- Exploratory holes have been drilled in these 5 geothermal areas
- Exploitation concessions have been granted to Laguna del Maule and Tolhuaca (San Gragorio Projects), where production wells have been drilled
- Well Tolhuaca 4, with an output of 12 MW, allows us to predict the installation of 70 MW geothermal power plant

- The Project belongs to GeoGlobal Chile and the environmental impact assessment has been submitted to the authority for approval
Many thank for your attention

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