

ELECTRIC CORPORATION OF ECUADOR



# Chachimbiro Geothermal Project



Futuro Energético

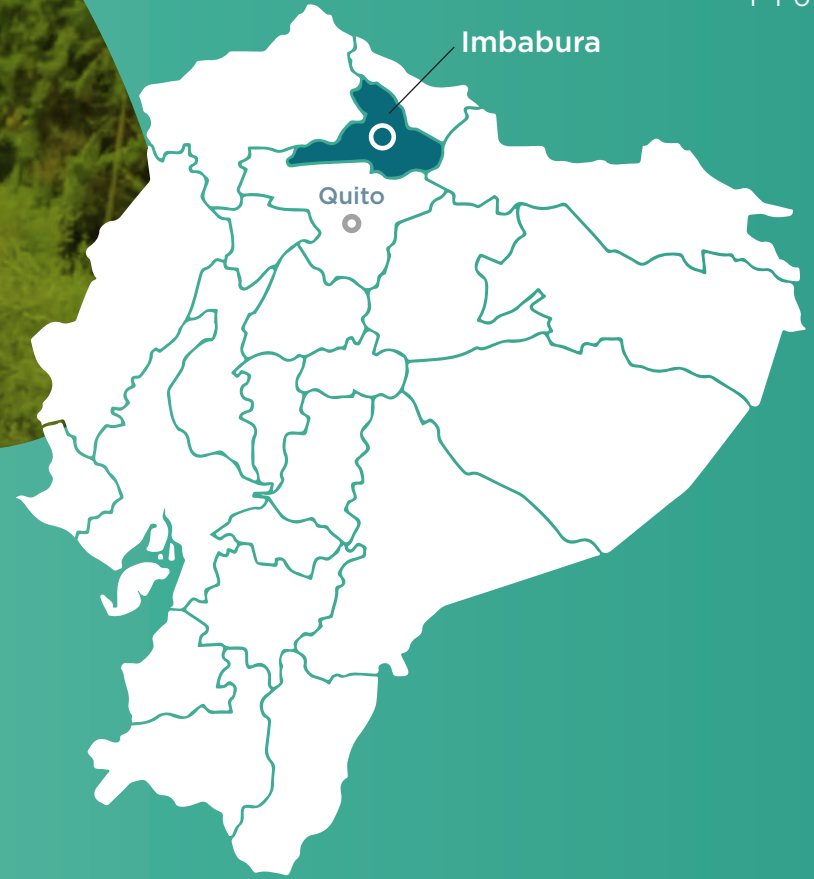


## LOCATION

## Chachimbiro Geothermal Project

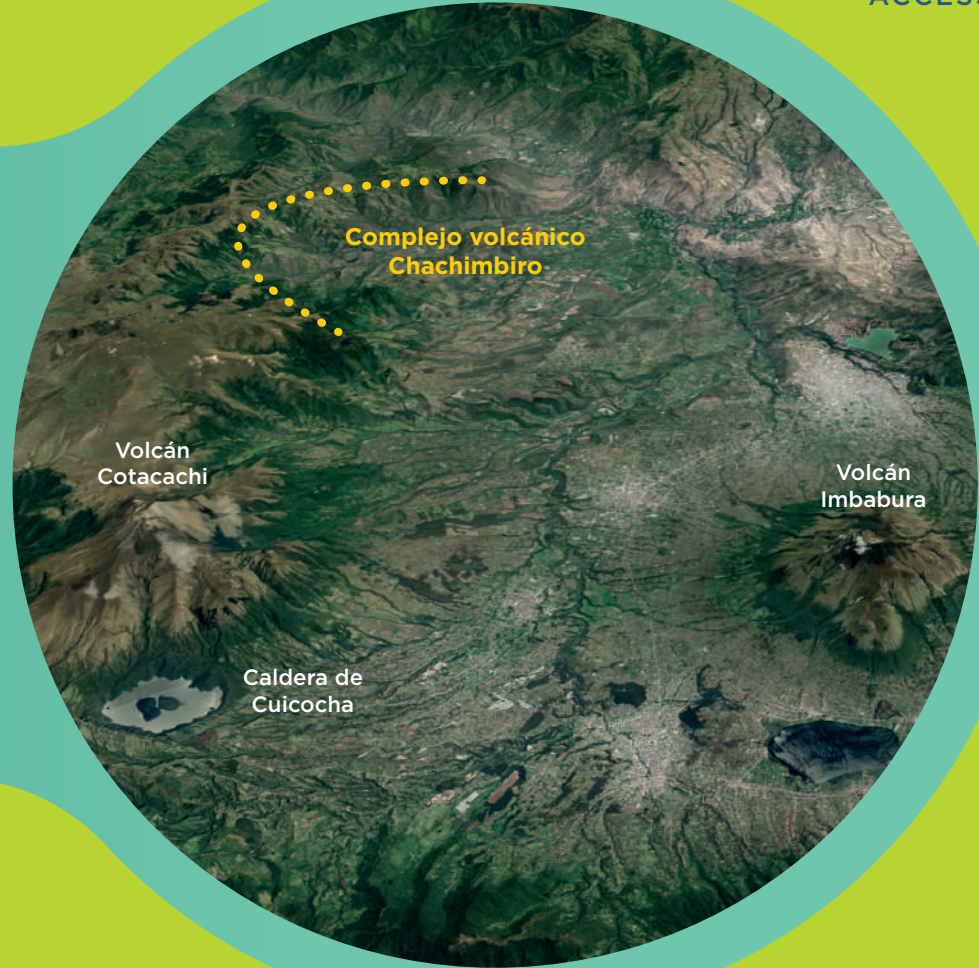


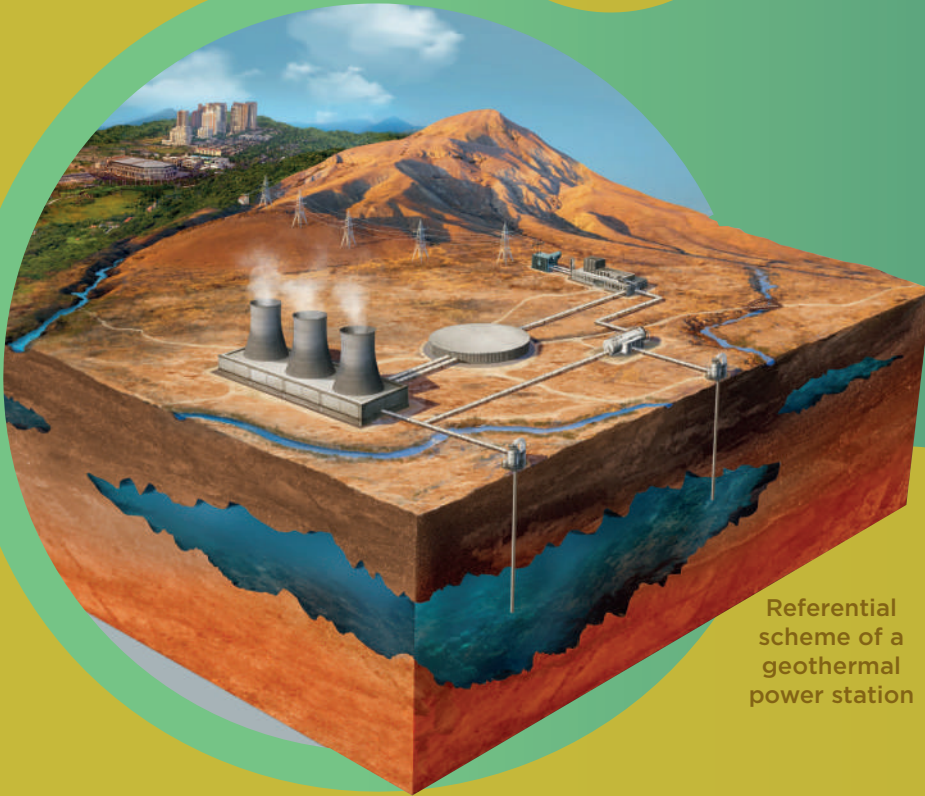
The Chachimbiro Geothermal Project is located on the eastern flank of the Western Mountain Range of the Ecuadorian Andes, in the province of Imbabura, in northern Ecuador, approximately 80 km NNE of Quito and 20 km MMW of the city of Ibarra.



It limits to the north and east with the Chota basin and the inter-Andean valley, to the south with the Cotacachi volcano and to the west with the Yanahurco volcano.

There is a main road of approximately 20 km that connects the cities of Ibarra and Urququi. After this road there is a paved section up to the entrance to the town of Azaya, and then from this point, access to places like Cochapata or Los Corrales through a dirt road. From this sector to the north, south and east, the mobilization can only be done through trails and mule tracks.





Referential  
scheme of a  
geothermal  
power station



The prospect is mainly based on a set of hot springs and temperate springs of chlorinated-bicarbonated waters (above 61°C), framed within the following coordinates:

	X	Y
1	808000	10054000
2	802000	10054000
3	802000	10047000
4	808000	10047000

Boundaries of  
the Chachimbiro  
Prospect WGS 84,  
Zone 17S

The best-known thermal manifestations in the area emerge along the Cachiycu River, in the Chachimbiro spa area.

In 2017 the first deep geothermal exploration drilling was carried out, the results of which showed the existence of temperatures of approximately 235°C.

### Interconnection



In the prefeasibility design, several options were analyzed, among these the closest substations are Pimampiro, Ibarra and Urucuquí.



	Level of study	Prefeasibility		
	Existing studies	<ul style="list-style-type: none"> <li>• Technical</li> <li>• Financial</li> <li>• Legal</li> </ul>		
	Power (MW)	50 MW	Energy (GWh/year)	394
	Estimated plant factor (%) and performance	90%	Date of approval of design/studies	March/2019
	Estimated construction time	78 months		
	Estimated construction budget	250 (MM USD)		

**PHASE 1:  
Field development  
Chachimbiro Geothermal Project**

Estimated budget	80.94 MMUSD
Financing	Partially through an ODA credit, granted by the Government of Japan, through JICA, for a maximum amount of 6,582,000,000 yen.
Estimated time of execution	42 months.

**PHASE 2:  
Construction of the  
Chachimbiro Geothermal Plant of 50 MW**

Estimated budget	169 MMUSD
Beginning of construction	To be confirmed once PHASE 1 is concluded.
Estimated time of execution	36 months.





On August 8, 2017 the Environmental Registry issued with No. MAE-SUIA-RA-CGZ1-DPAI-2017-4660 was carried out, which authorizes the execution of the project in compliance with applicable environmental regulations and subject to supervision by the competent authority. The environmental registration will be valid for the activities corresponding to the geothermal power generation facility with power greater than 1 MW and less than 10 MW, considered to implement early generation of 5 MW in PHASE 1 of the Project.

The Social Management of the Chachimbiro Geothermal Project has focused on establishing and maintaining the relationship at the political, institutional and community level, this has allowed all project interventions in the area to be visible without delay or setbacks.





The quality life of the population has been improved by providing employment and opportunity in the offer of services to the communities in the area of direct influence and attending to basic needs, such as improvements in health care: attention to vulnerable groups through training and health campaigns (women, children and the elderly). A direct line of work is maintained with the Municipality of Urququi to optimize efforts and resources that allow complementarity in attention to the population and access to information on the territory.

The communities that are closer to the project are: Azaya with 80 families and Cochapata with 20 families. Azaya is closer to the cantonal capital of Urququi and its main activities are agriculture and construction. Cochapata is very close to the project and its main activity is agriculture. Two additional communities are located on the access road and are considered for the Field Development stage: Ajumbuela and Pingunchuela, with around 150 families. The rural communities are recognized by the Ministry of Agriculture and Livestock (MAG), and their leadership is renewed every year.





Futuro Energético



**CELEC** ep

Corporación Eléctrica del Ecuador