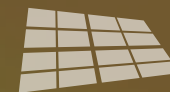


ELECTRIC CORPORATION OF ECUADOR



# La Ceiba Photovoltaic Project



Futuro Energético



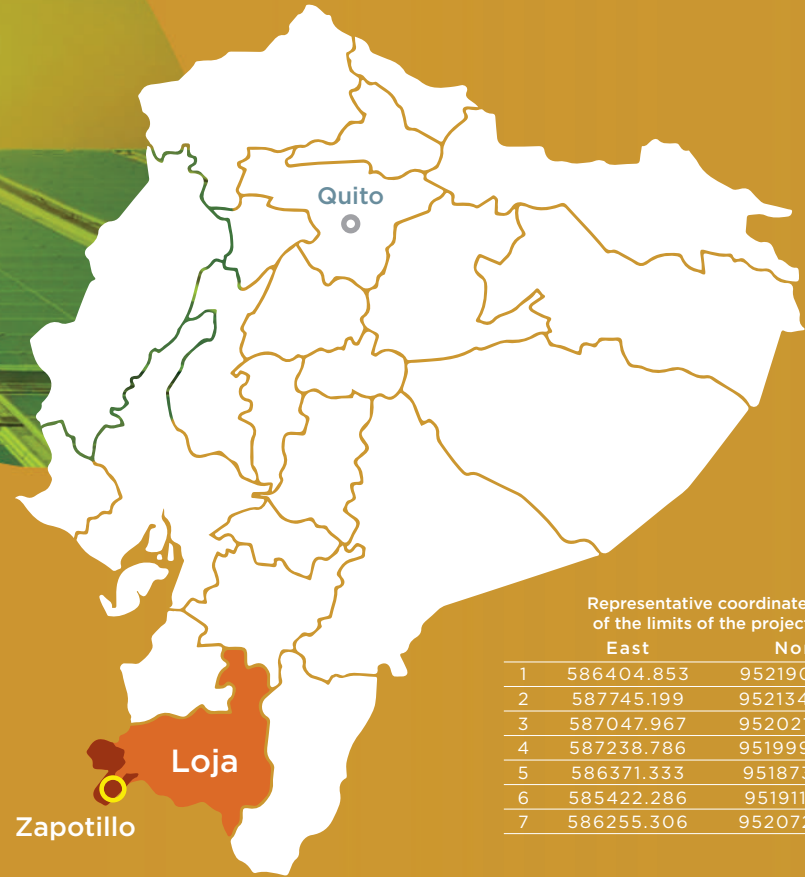
## LOCATION

Ecuador

Galápagos



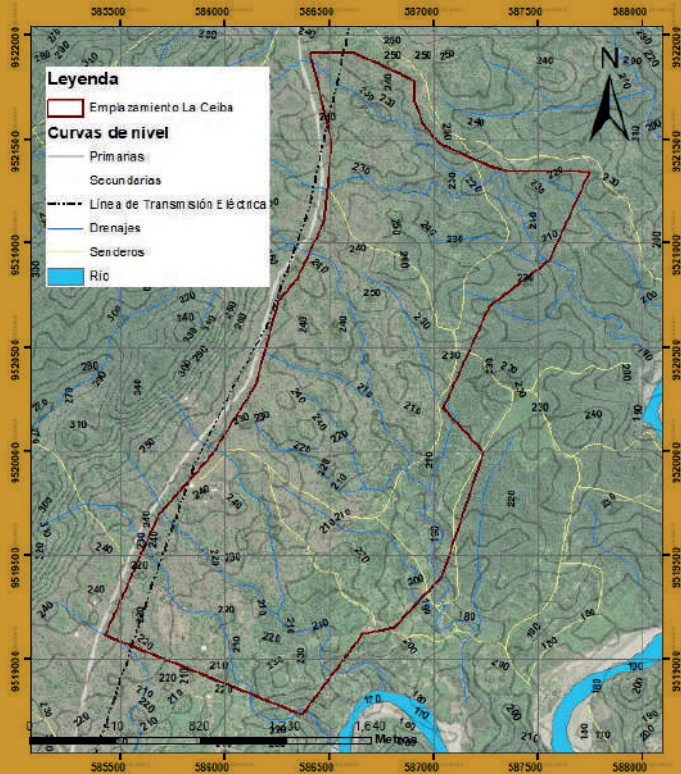
“La Ceiba” photovoltaic project is located in Zapotillo canton at an approximate distance of 1.9km from La Ceiba, the closest town to the project and approximately 4km from the city of Zapotillo.



Representative coordinates of the limits of the project

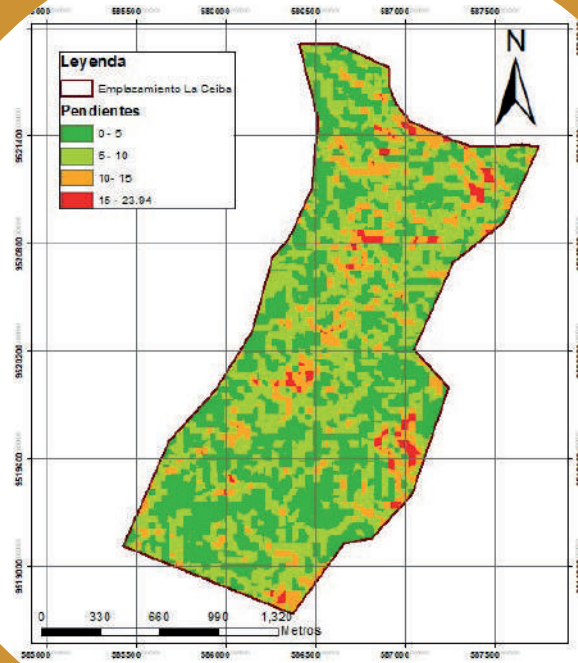
	East	North
1	586404.853	9521909.274
2	587745.199	9521340.294
3	587047.967	9520210.389
4	587238.786	9519994.593
5	586371.333	9518732.813
6	585422.286	9519117.034
7	586255.306	9520723.729





Topographic map of the "La Ceiba" site.

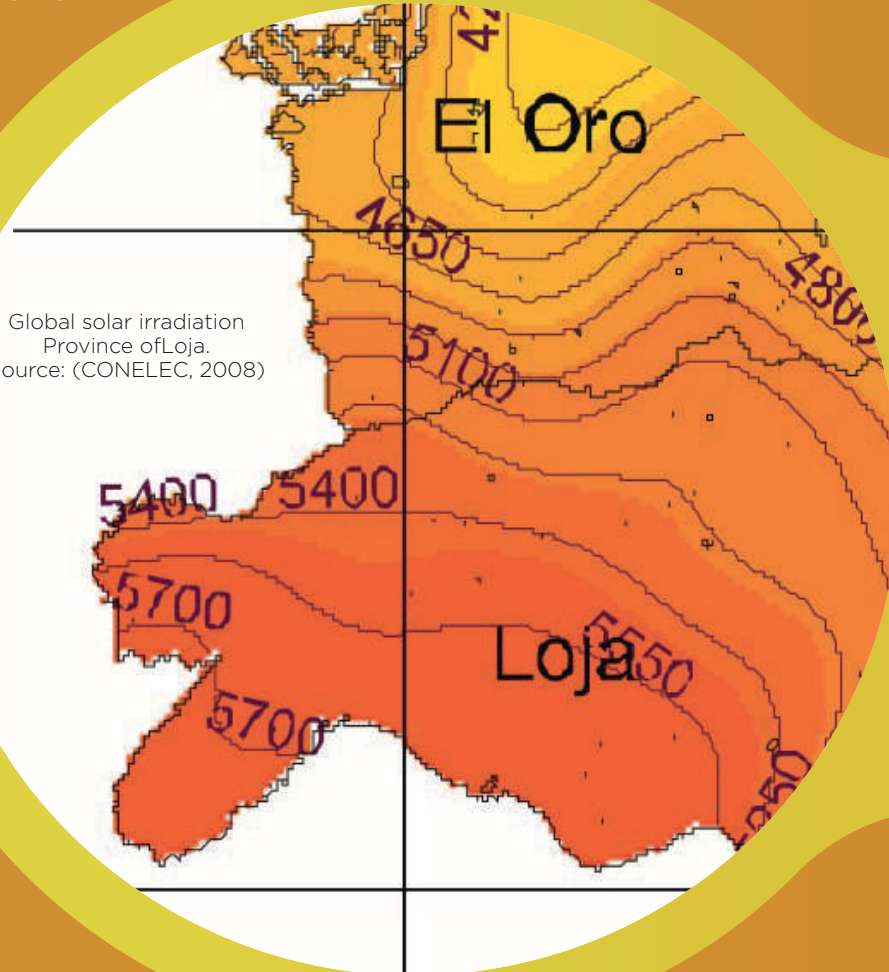
The polygon of the site has an extension of 322.4 Ha, with NE-SW orientation and a height that goes from 180 to 250 m.a.s.l (graphic 2). Topographically, the area has a maximum unevenness of 70m (graphic 3), presenting minority areas with slopes that reach up to 30° inclination. Most of the slopes are up to 20°. That is why an adaptation of the land must be done to allow the installation of the photovoltaic plant for its safe, efficient operation and low environmental impact.



Slope map of the photovoltaic site "La Ceiba"



Global solar irradiation  
Province of Loja.  
Source: (CONELEC, 2008)



Graphic 4 shows the level of global solar irradiation of the province of Loja as indicated by the Solar Atlas of Ecuador for electricity generation purposes by CONELEC in 2008, obtained from the Solar Atlas of Ecuador (CONELEC, 2008), which has average values of 5,400 Wh/m<sup>2</sup>/day, which is a value above the national average in other regions of the country. Currently, CELEC EP has a solar resource measurement station that has been operating since May 2021.



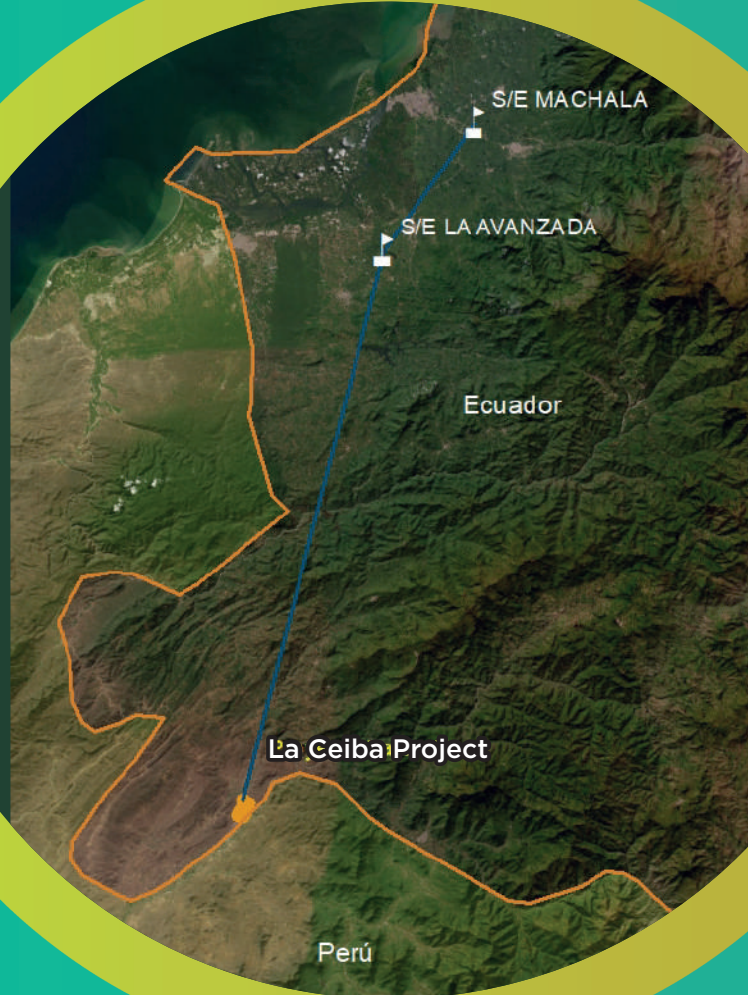
	Level of study	Project profile		
	Existing studies	Analysis of energy production and interconnection carried out by CELEC EP		
	Power (MW)	200.1	Energy (GWh/year)	396.8
	Estimated plant factor (%) and performance	22.65%	Date of approval of design/studies	No studies
	Estimated construction time	24 months		
	Estimated construction budget	170 (MM USD)		





## INTERCONNECTION

An S/E is proposed in the project with a voltage step-up transformer from 45.5 to 230 kV. The interconnection alternatives are the following:



### **Alternative 1: Connection S/E La Ceiba - S/E La Avanzada at 230 kV**

This alternative consists of the connection of the S/E of the La Ceiba project with the S/E La Avanzada, which is included in the Electricity Master Plan and has a projection of entry to the INS by the year 2026. The distance of the L/T is 95km at a 230 kV level. For the L/T there are two options: i) simple circuit; and ii) double circuit, the latter considering a possible expansion of the La Ceiba project or another project due to the existing photovoltaic potential in the area.

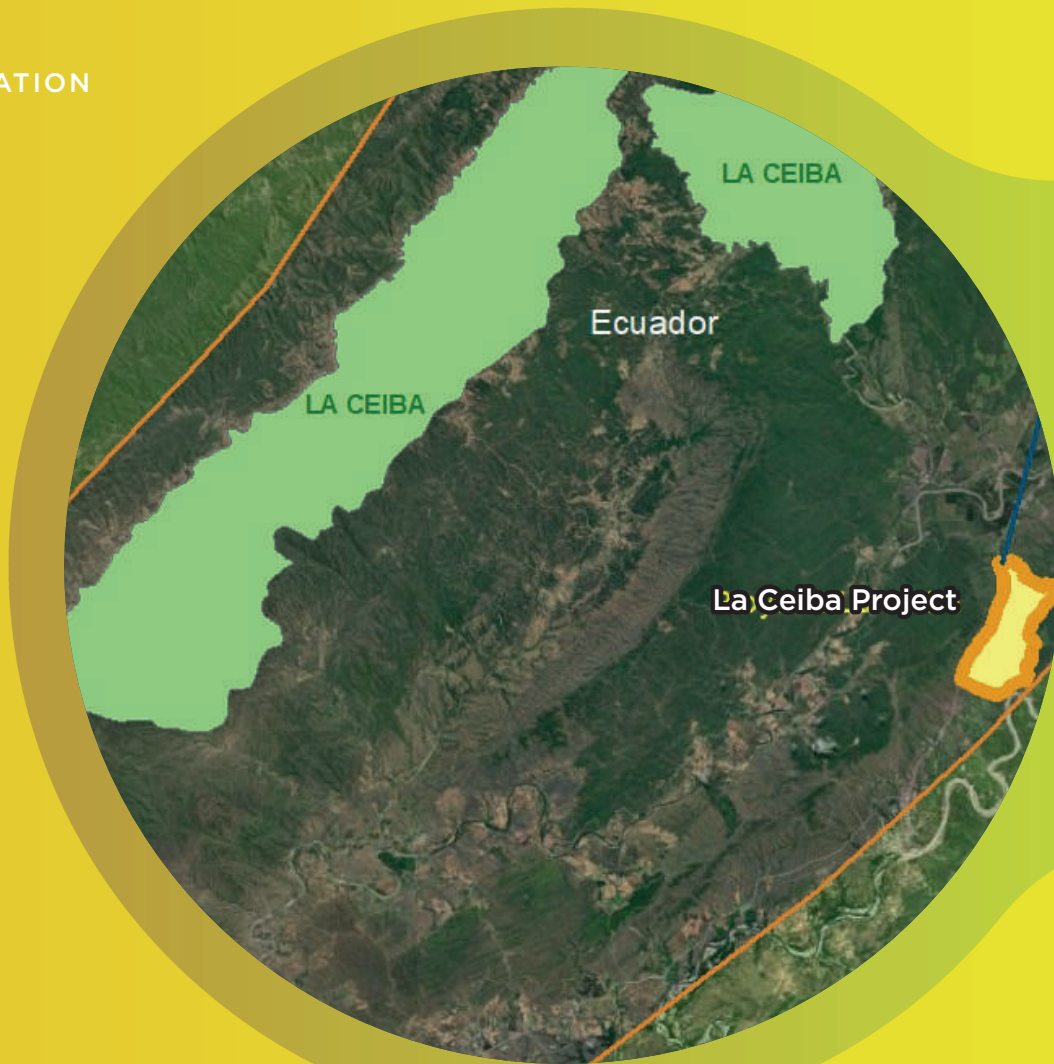
**Alternative 2:  
Connection S/E La Ceiba - Catacocha - S/E La Avanzada  
at 230 kV**

This alternative consists of the interconnection of the S/E of the La Ceiba project with the S/E La Avanzada at 230 kV, but considering that the Membrillo Ducal and Matala projects can be connected by a simple circuit line also to La Avanzada, both lines would have their independent routes to Catacocha (there will be no substation) and from this place with a double circuit line the project would reach La Avanzada.





The “La Ceiba” site is not located within any Conservation Area of the National System of Protected Areas (NSPA) of Ecuador, or Municipal Conservation Areas (MCA), see Graphic 5. However, due to the size of the project its necessary to complete the environmental impact studies for the final design of the photovoltaic plant to obtain environmental licensing with the competent authorities.



On the other hand, the polygon of the location intersects a total of 25 private properties, whose referential information is available from preliminary studies obtained with information from SIGTIERRAS of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries.







Futuro Energético



**CELEC EP**

Corporación Eléctrica del Ecuador