

Feasibility assessment for geothermal potential in Las Trincheras - Mariara, Venezuela



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Just imagine the **largest** world's oil reserve country⁽¹⁾ going into a **renewable energy as geothermal**

7 AFFORDABLE AND CLEAN ENERGY



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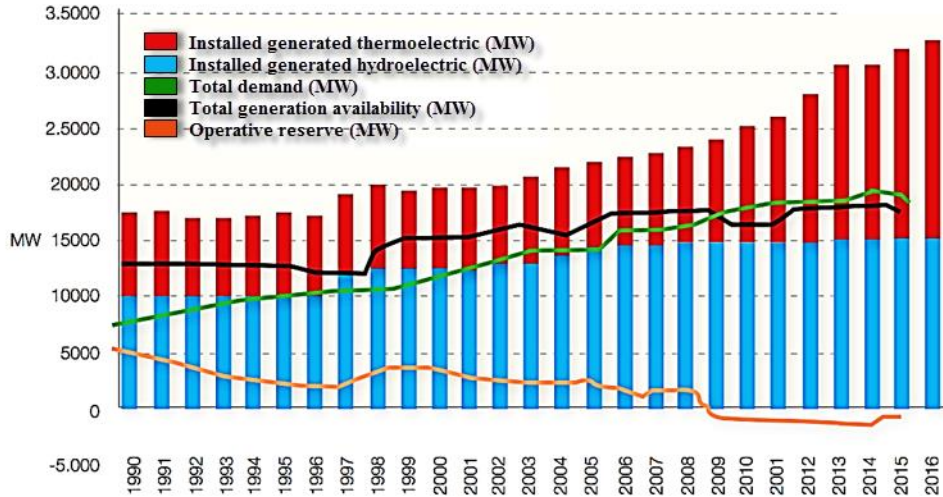
Maracaibo Basin, Zulia, Venezuela

Source: DW© picture – alliance/dap/ C. Sánchez

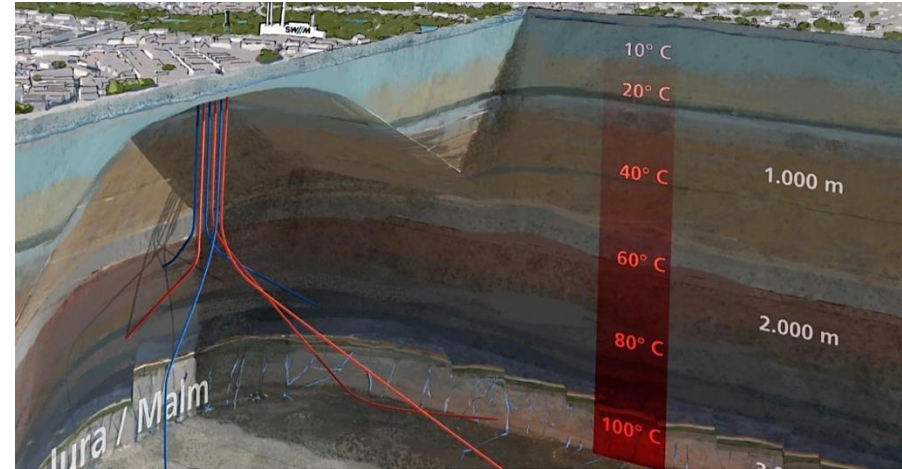
⁽¹⁾ With 300,878 million barrels of proven reserves, Venezuela has the largest amount of proven oil reserves in the world.

Source: Mu, XZ. & Hu, GW. Pet. Sci. (2018) 15: 200. <https://doi.org/10.1007/s12182-018-0215-4>

Valencia and Maracay, Venezuela 2 MM people would demand 312 MW



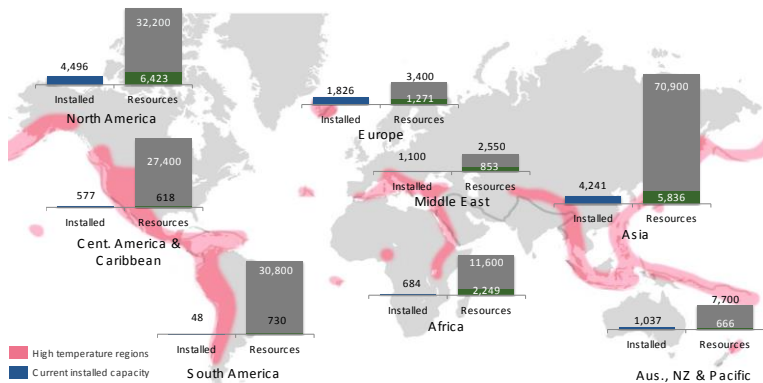
Munich, Germany 50 MW plant 80,000 residences (320,000 people)



6.25 x Munich Geothermal Capacity Needed

Disclaimer

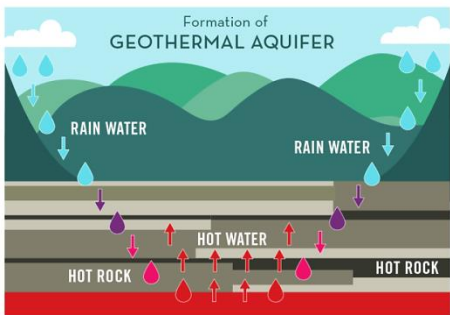
The views expressed on this poster are those of the author and do not necessarily reflect the view of the CTBTO.



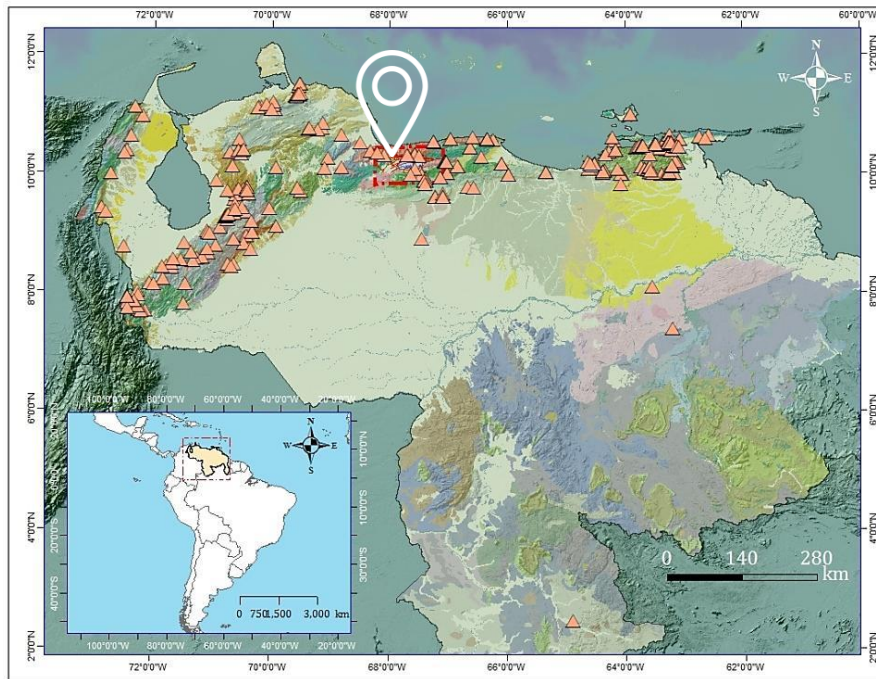
Note: Installed Capacity of 2017 [2015], resource estimates combined (1999-2012) - IGA estimates a conservative total potential of 70,900 MW and with technology improvements (extended use of low heat and G&S resources) at around 140,000 MW in power generation capacity.

Geothermal energy in Europe and the rest of the World.

Source: A. Richter (2018) "Think Geoenergy".



City of Boise:
Geothermal source,
Aquifer in Boise's
foothills, USA



Hot springs distribution and chemical composition.

F. Urbani (1986) "Venezuela's Geothermal Inventory".

A. Singer (2015) "Las Trincheras Active Fault".

P. Hackley, F. Urbani, et al. (2006) "Base Map".

- ✓ Raise of awareness of **renewable** alternatives in an Oil cultured country.
- ✓ The area would benefit from **CLEANER** and **RENEWABLE** source of energy

FUNVISIS would link :

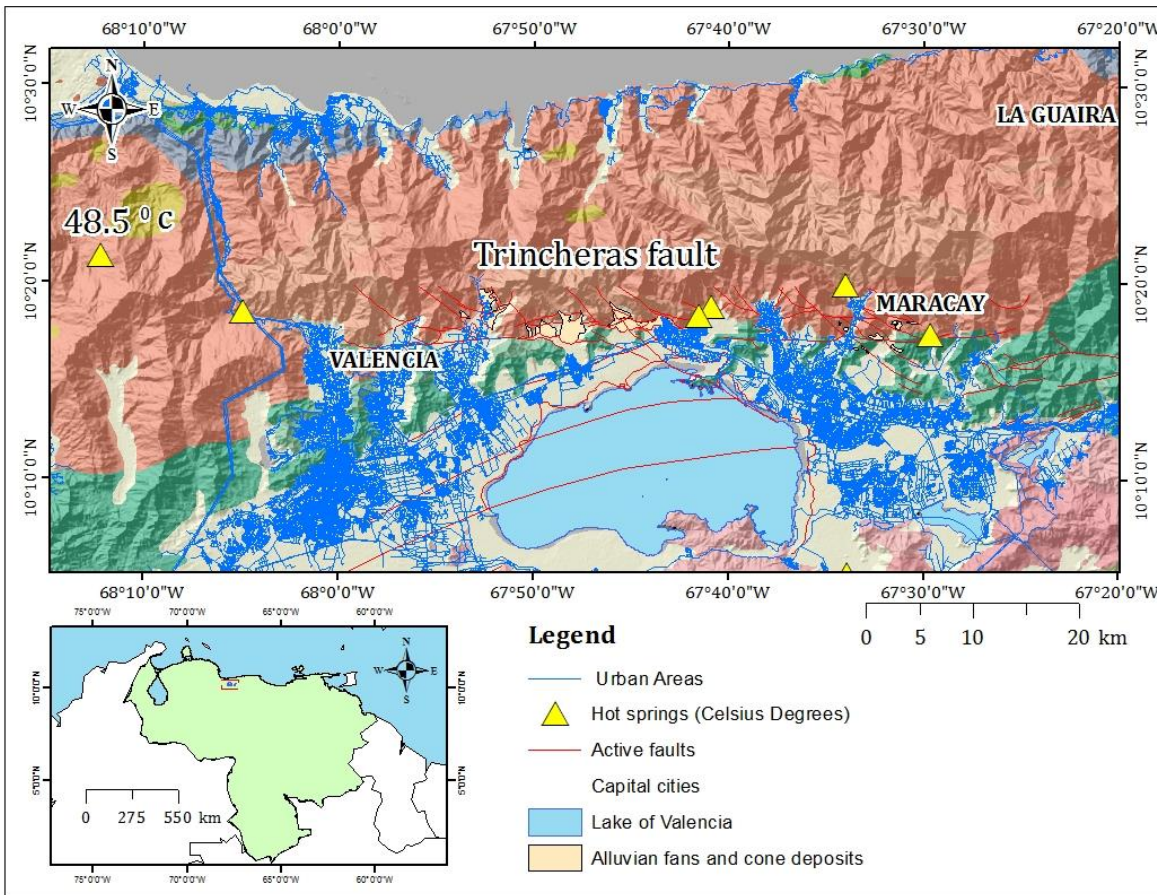
- ✓ Seismic activity in Valencia and Maracay Cities to a Geothermal source
- ✓ Lower Seismological hazard



- ✓ Lowering **risk** by understanding seismological hazard for MICROZONATION and a **SUSTAINABLE CITY**

Enlarge **CTBTO** pool of analysis related to:

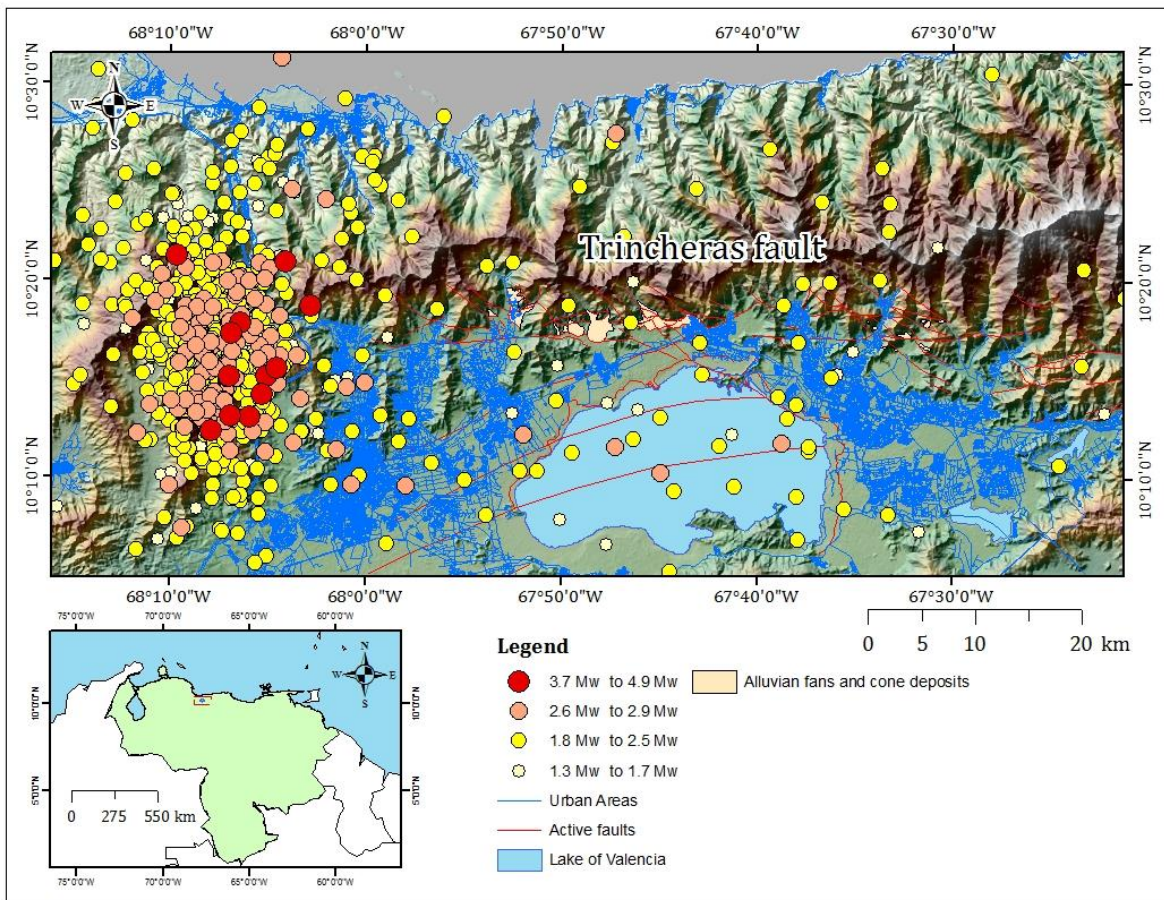
- ✓ **Nano-seismicity**
- ✓ Pattern recognition algorithms
- ✓ Events characterization in time/frequency domains
- ✓ Geological characterization of fractures and faults



Hot springs distribution and geological setting.

P. Hackley, F. Urbani, et al. (2006) "Base Map".

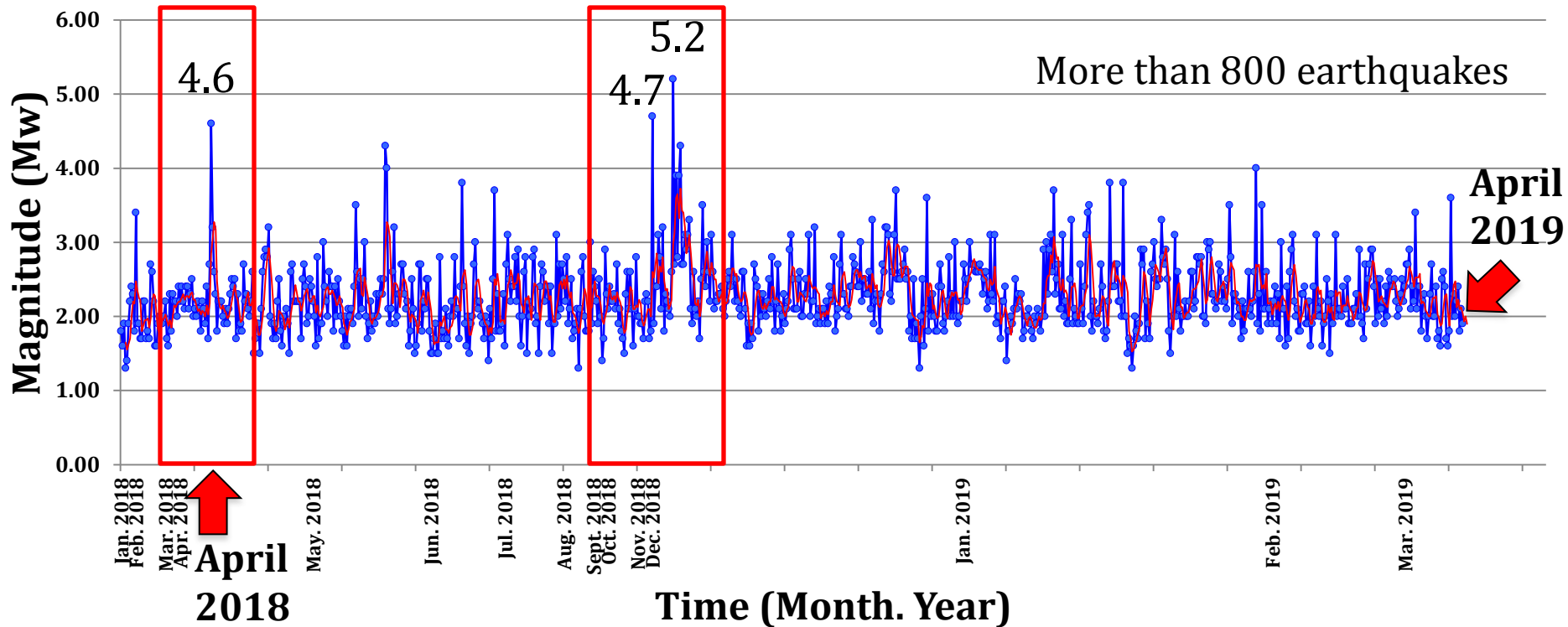
A. Singer et al. (2015) "Active faults".



Seismological hazard map: swarm seismicity from April 2018 to April 2019, Active faults.

A. Singer et al. (2015) "Active faults".

Recorded Seismicity of Valencia and Maracay cities from April 2018 to April 2019



Historical data gathering and available data:

- Temperature & chemistry
- Geological Mapping
- Hydrogeology
- Historical reports
- Seismicity
- Possible areas

Seismic events Relocation

Softwares Geotool /
HYPOLINE AND ILOC/IDC
Pattern recognition
analysis

Survey planning

Local authorities permits

Fieldwork

Fieldwork report writing Geophysical and Geological characterization

Modeling and Lab tests:

- Laboratory tests
- Interpretation (Seismicity – Seismic- EM-Geology – wells and Brightness temperature) satellite images
 - Flow model
 - Heat flow map
 - Integration

Report writing:

Feasibility
assessment for
geothermal
potential in
Las Trincheras -
Mariara,
Venezuela

Feb
2019

Milestone 1

Milestone 2

Milestone 3

May
2021

Sept
2019

2020

Mar
2020

Nov
2020

2021

2021

We are here!
Jun SnT 2019

Survey window

TIMELINE



Thank you