



GEOTHERMAL SECTOR IN CHILE

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JORKA ENERGY
ENERGY TRANSITION & RENEWABLES

WWW.THINKGEOENERGY.COM

WWW.PIENSAGEOTERMIA.COM

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POWER SECTOR IN CHILE

- **Ministry of Energy is responsible for the regulation of the sector**
 - No space for FiT
- **Generation: Deregulated market and existence of “spot” and “contract markets”**
- **Transmission and Distribution sectors are regulated monopolies**
- **Fuel imports is done by ENAP or private companies (3 refineries in the country) (75% is imported - 2018)**
- **Existing goals for the sector**
 - 20% of Non-Conventional Renewable Energy by 2025
 - Carbon Neutrality by 2050
- **Since 2017 the National Oil Company –ENAP- (state own) became power generator and new player in the market**
- **PPA options**
 - **Bilateral negotiation with off taker**
 - **PPA under energy auction for regulated clients**
 - Sport market operated by the National Grid Operator
 - Stabilized Spot market for small R.E. projects <9MW

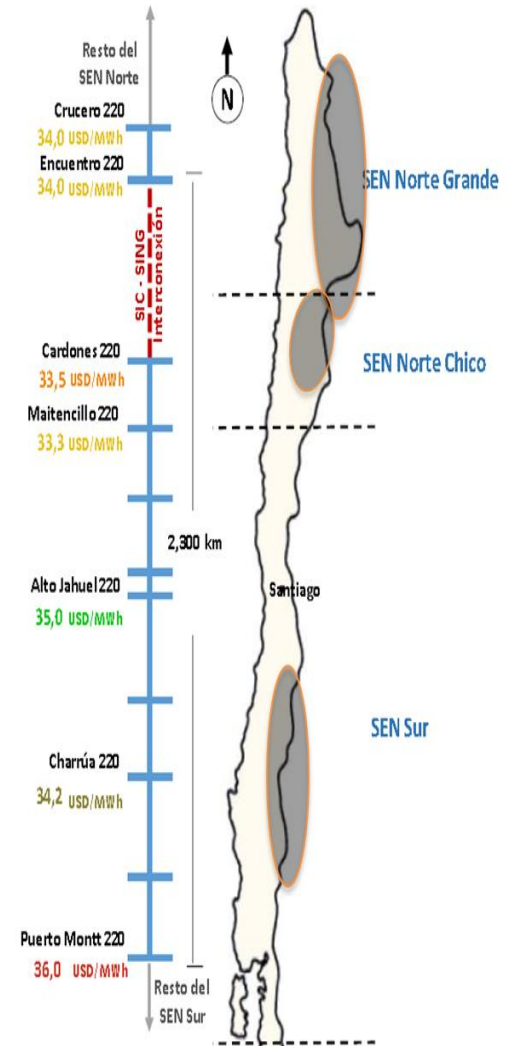
GEOHERMAL IN CHILE

- **Geothermal Players:**
 - **JV between Enel Green Power & ENAP: 48 MW online**
 - **Energy Development Corporation**
 - **Transmark Chile**
 - Energía Andina
 - Serviland & Infinergeo
- **Proper regulation for the geothermal sector**
 - Geothermal Law kick off in 2000
 - Law improvement under discussion (2019/20): Power Generation vs. Low Enthalpy
 - Concessional system: exploration and exploitation
 - 1st Indigenous consultation one step in the exploitation concession granting process
 - 2nd indigenous consultation during the EIA
- **Incentives**
 - VAT exemption
 - Custom fee exemption
 - Accelerated depreciation
 - Risk Mitigation funds for Chile
- **Geothermal Potential**
 - **3.800 MW (based on exploration data)**
 - Country potential to be developed
 - Theoretical potential: 16.000 MW (A. Lahsen)



ATTRACTIVE MARKET FOR GEOTHERMAL

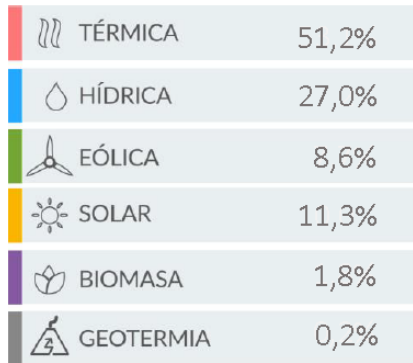
- **Key challenge for geothermal projects in Chile is getting a suitable PPA**
- **National Grid Challenges opens opportunities to Geothermal Opportunities**
 - Explosive introduction of variable renewable energy sources (~20% capacity by end of 2019)
 - Extensive drought that is expected to continue and it impacts on hydro production
 - Carbon power production step out program (2025 & 2050)
 - Transmission risk vs. geographical distributed generation (like geothermal)
 - Ancillary services
 - Ramp up/down: 5.2 GW by Solar PV
 - 2.848 MW solar PV installed capacity
 - ~2.400 MW solar PV under construction (Feb. 2020)
- **Energy Auction for the regulated sector**
 - National Geothermal Council is preparing a proposal during 2020, which will allow geothermal to compete
 - Long term PPA with a regulated contract
 - Geothermal projects closer to demand
- **Social License**
 - Carbon neutrality
 - Educated citizens thinking in the future and sustainability
 - Challenging social license for Gas
 - No more carbon



Source: *Generadoras de Chile*

CHILE - POWER SECTOR IN NUMBER

- Installed Capacity in the country: 25,3 GW → 99% SEN (March 2020)



Installed Capacity	MW
RENOVABLE	12.329,2
HIDRO EMBALSE	3.395,3
HIDRO PASADA	3.427,6
BIOMASA	451,1
EÓLICO	2.161,8
SOLAR	2.848,4
GEOTÉRMICA	44,9
NO RENOVBABLE	12.928,6
GAS NATURAL	4.843,4
CARBÓN	5.192,4
DERIV. DEL PETRÓLEO	2.892,8
TOTAL	25.257,8

- Peak Demand: 10.6 GW
- Min. Demand: 7.2 GW

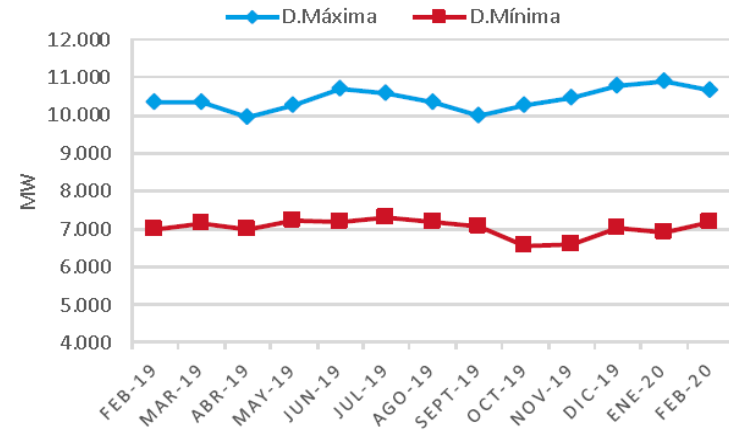
- Projects under construction (Feb.2020):

- 3.8 GW (87.5% Renewable Energy) & US\$ 9,238 million investment

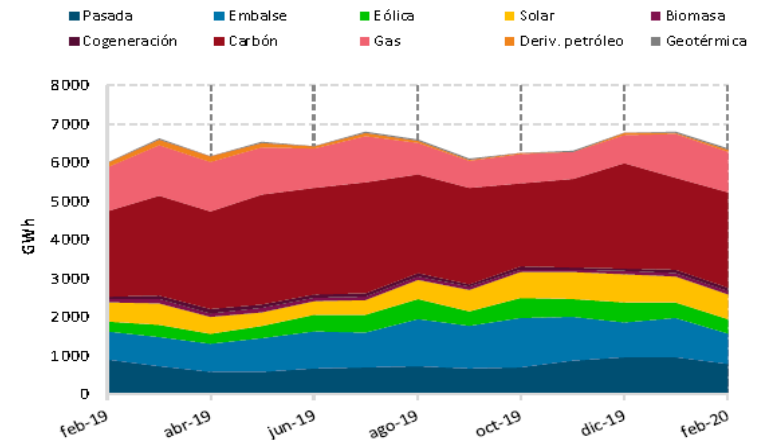
Statistics from March 2020

- Total production: 6.363 GWh
- Total demand: 5,889 GWh
- Demand Regulated vs Nonregulated Clients: 40% / 60%
- Marginal Cost: 42.5 U\$/MWh
- Average market PPA's: 87.5 U\$/MWh

- 1 Year Power Demand Profile



- 1 Year Power Generation by source



Source: Generadoras de Chile



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GEOTHERMAL NEWSLETTER

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ANNEX

PIENSAGEOTERMIA & THINKGEOENERGY

SERVICE OFFERINGS

ThinkGeoEnergy provides extensive consultancy services based on our unique and extensive research, experience, network and understanding of the global geothermal energy market.

Research

ThinkGeoEnergy delivers market research and analysis of key elements and markets of the global geothermal energy sector helping to define trends and opportunities.

Including:

- Current **market status**
- Projects in **development**
- Companies active
- Insightful and actionable **market information**
- Business & **Market Strategies**
- Wide **network access**

Marketing

ThinkGeoEnergy provides additional marketing services that help you to structure your marketing efforts, be it through banner advertisement, preparation of exhibitions, print material and your web presence.

Including:

- **Demand** and Business analysis
- **Content marketing** strategies
- Approaching **social media** options
- Developing **market strategies**
- Work on **Corporate Visibility**
- Support on **Events & Exhibitions**
- Company & Market **Positioning**

Communication & PR

ThinkGeoEnergy can help you with your communication efforts, be it in concise PR campaigns, press release services, outreach to media, and helping you develop a concise social media strategy.

Including

- Define your **communication needs**
- Prepare **media packages**
- Prepare **press releases**
- Concise **PR strategy**
- **Social media strategy & content** marketing development
- **Social media structuring**

Alexander Richter

Senior Geothermal Consultant & Principal – ThinkGeoEnergy
President – International Geothermal Association

Founded in 2008, ThinkGeoEnergy is the leading source of geothermal news and the most respected source on information on global geothermal energy development. With its English, Spanish and Turkish websites, our e-mail newsletters and social media presence, we uniquely reach all decision makers in the global geothermal energy sector.

With this Overview, we provide you details on:

- Our website & newsletter
- Marketing & Communication services
- Events and more

Consultancy Services

With our **research, marketing, communication and strategy focused services** we are sharing our unique and extensive research, experience, network and understanding of the global geothermal energy market, and locally with partners across the world.

Thank you for your continued engagement and support.



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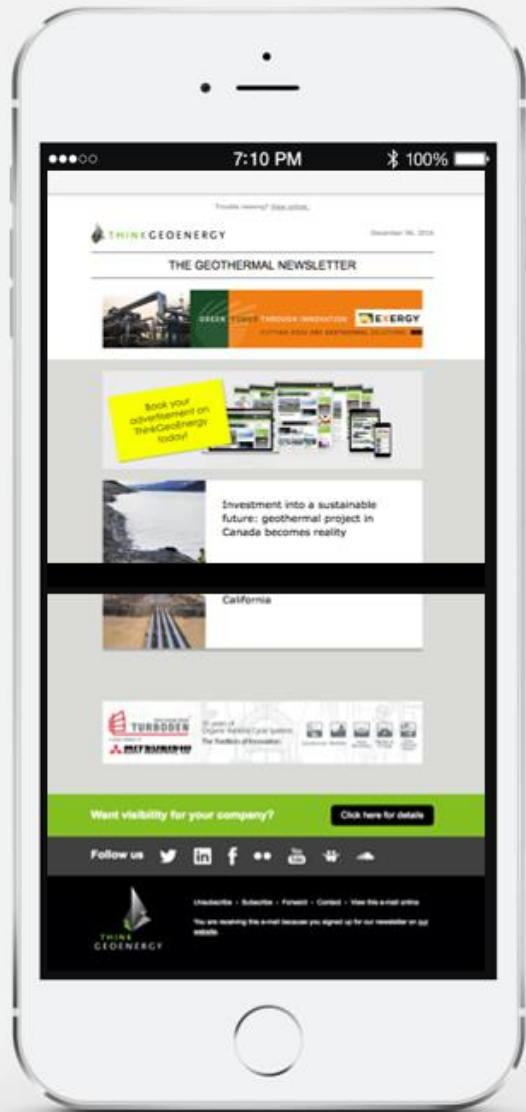
PARTNER TO NATIONAL AND INTERNATIONAL GEOTHERMAL INDUSTRY GROUPS

Since its inception, ThinkGeoEnergy has been supporting various national and international geothermal associations, as well as initiatives and groups.

The following are a selected few of the organizations/ initiatives supported:



THINKGEOENERGY NEWSLETTER



ThinkGeoEnergy has been publishing its weekly newsletter since 2010, reaching today around 7,000 subscribers for its English, Spanish and Turkish websites.

It represents today around 7% of our total traffic to the website of ThinkGeoEnergy.

Subscribers:

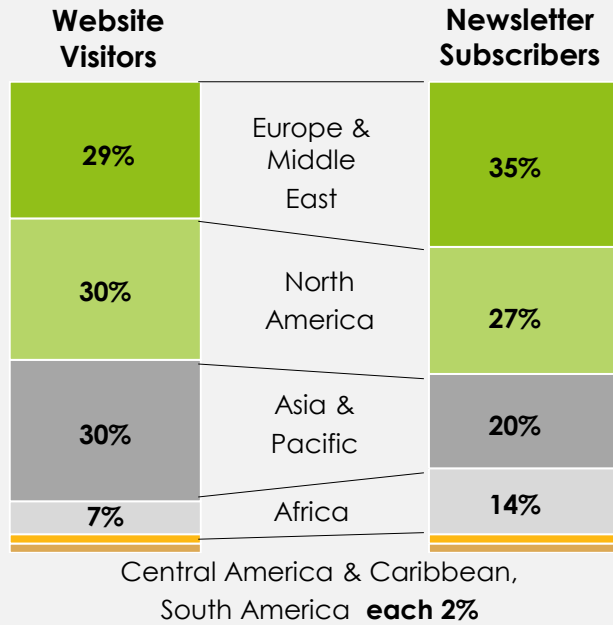
- ThinkGeoEnergy – 4,700
- PiensaGeotermia – 1,700
- JeotermalHaberler - 600

THINKGEOENERGY - ENGLISH NEWS SERVICE

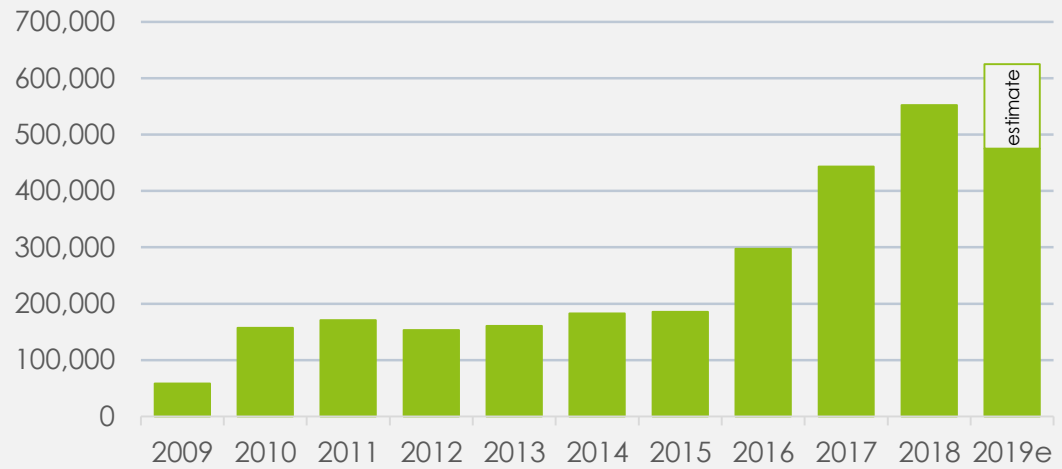
REACHING THE GEOTHERMAL INDUSTRY'S KEY DECISION MAKERS

Founded
in 2008

Readership



Unique visits to ThinkGeoEnergy Website – 2009-2019e



88,000

Monthly page views

360,000

Yearly unique visitors

28%

Year-on year visitor growth

4,700

Newsletter subscribers

14,000+

Social media connections



Twitter

20k tweets, 5,100+ followers



Facebook

5,000+ Followers



LinkedIn Group

3,300 members



Flickr.com

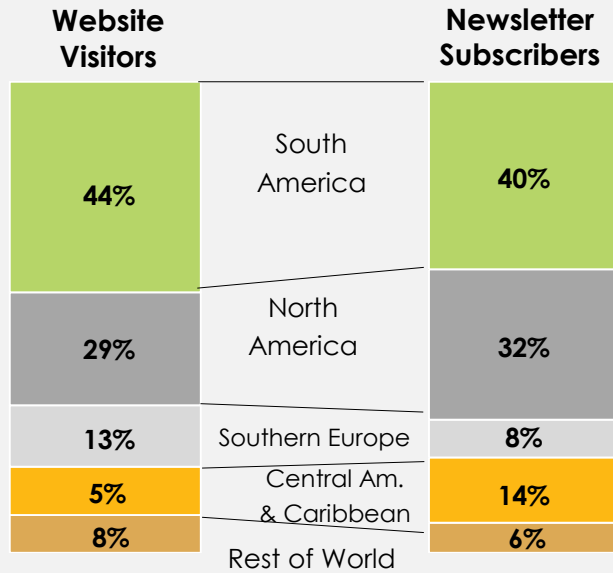
2,000+ pictures posted

PIENSAGEOTERMIA – SPANISH NEWS SERVICE

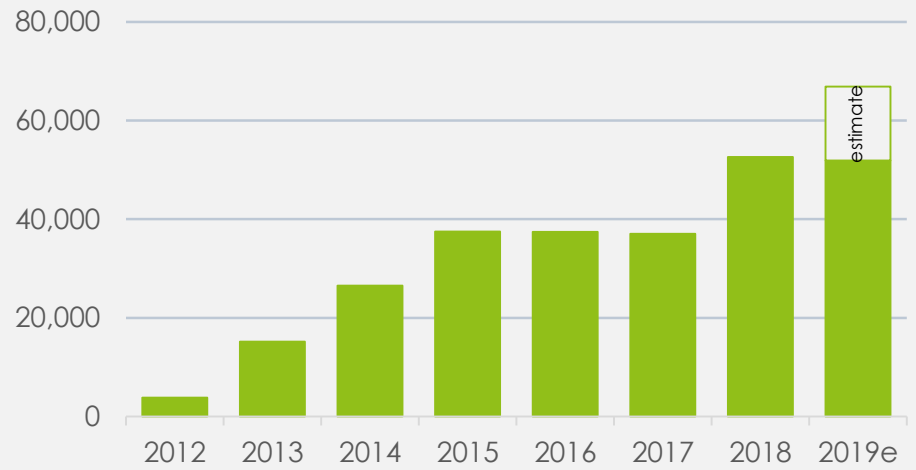
REACHING THE SPANISH-SPEAKING GEOTHERMAL MARKETS

Founded
in 2012

Readership



Unique visits to PiensaGeotermia Website – 2012-2018



12,000

Monthly page views

53,000

Yearly unique visitors

44%

Year-on year visitor growth

1,600

Newsletter subscribers

3,000+

Social media connections

Social Media Handle @PiensaGeotermia





@thinkgeoenergy

@piensageotermia

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