2016 Spain Country Report

GEOPLAT - Spanish Geothermal Technology Platform

July 2017

IEA Geothermal

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1. Introduction

Geothermal power plants haven't been developed in Spain so far. The current subsidies framework and the new Spanish renewable energy auctions are unfavourable. The production of electricity from geothermal sources is not eligible to receive any kind of subsidy (like other novel renewables such as ocean energy). Furthermore, another limitation for the deep geothermal sector is the lack of detailed knowledge about geothermal resource potential in Spain.

Nevertheless, the installed capacity of geothermal energy for thermal uses has kept on modestly growing over the last three years, mainly due to the slight growth of the heating and cooling installations market in the residential and tertiary sectors.

Electricity		Direct Use	
Total Installed Capacity (MW_e)	0	Total Installed Capacity (MW_{th})	
New Installed Capacity (MW_e)	0	New Installed Capacity (MW_{th})	
Total Running Capacity (MW_e)	0	Total Heat Used (PJ/yr) [GWh/yr]	
Contribution to National Capacity (%)	0	Total Installed Capacity Heat Pumps (MW_{th})	225*
Total Generation (GWh)	0	Total Net Heat Pump Use [GWh/yr]	
Contribution to National Generation (%)	0	Target (PJ/yr)	
Target (MW_e or % national generation)	0	Estimated Country Potential (MW_{th})	<50,000*
Estimated Country Potential (MW_e or GWh)	0		

(N/A = data not available)
(* indicates estimated values)

2. Changes to Policy Supporting Geothermal Development

In early 2016, the Spanish government held its first energy auction (500 MW of wind power and 200 MW of biomass). In autumn 2016, the Spanish government announced plans to hold a new renewable energy project auction (3000 MW for any new solar PV or wind power plants), eagerly awaited from the national industry and international players, with high expectations that the auction design would be simplified and/or consider some characteristics of the Spanish market reality. None of those auctions concerned geothermal.

However, there are still some exploration permits which have being maintained in the hope that better supporting measures for geothermal energy will be adopted in the medium term.

3. Geothermal Project Development

3.1 Projects Commissioned (in the reporting year)

Geothermal heating & cooling projects

The sector of shallow geothermal for HVAC (heating, ventilation, and air conditioning) and DHW (domestic hot water) in Spain maintains a slow but growing development. This is helped by a 'building rehabilitation' trend, where geothermal is starting to play a little role in Spain, and also by recovery in the housing sector. According to the information provided by the Spanish Association of Heating and Cooling Networks (ADHAC), in 2016 in Spain there were two geothermal district heating & cooling systems: http://www.adhac.es/Priv/ClientsImages/AsociacionPerso8_1476438639.pdf. One of these systems is in Balearic Islands and the other one is in Madrid.

Geothermal R&D projects

The EU Research and Innovation programme, Horizon 2020, awarded one geothermal project in 2016 with Spanish participation in its consortium. This geothermal project is:

- **GEOCOND - Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage**
  - Topic: LCE-07-2016-2017 - Developing the next generation technologies of renewable electricity and heating/cooling
  - Funding scheme: RIA - Research and Innovation action
  - EU contribution: EUR 580 000
  - Coordinator: UNIVERSITAT POLITECNICA DE VALENCIA (Spain)
  - Spanish Participants: AIMPLAS - ASOCIACION DE INVESTIGACION DE MATERIALES PLASTICOS Y CONEXAS; EXTRULINE SYSTEMS S.L.
  - More info: http://cordis.europa.eu/project/rcn/209743_en.html

4. Research Highlights

In 2016, geothermal energy for heating and cooling applications and production of domestic hot water (DHW) in buildings has experienced a subtle change in trend. The installation of these geothermal exchange systems has been intensified in all types of buildings (both in new construction and building renovation) compared to previous years, in which the economic and real estate crisis was intensely manifested. Likewise, the commitment of public administrations to have geothermal exchange systems in public buildings has increased, given the need to ensure that the new public buildings fit into the concept of zero energy consumption buildings promoted by the European Union.

However, during 2016, geothermal energy for power generation has continued in stand-by mode. The requested exploration permits are either maintained or expired due to the impossibility of promoting projects in the established system of renewable power auctions. Only in the Canary Islands has there been a clear movement in favor of geothermal energy with the Government's decision to edit a series of official manuals which characterize the geothermal resource in the archipelago and analyze the conditions for its exploitation. It should be borne in mind that, in addition to the geothermal uses for air conditioning traditionally used by large hotels in the Canary Islands, geothermal power generation can play a key role in the island's energy transition. A massive uptake of interruptible renewable energy sources such as wind power and solar

photovoltaic energy would require the use of renewable energy base load power that is 100% dispatchable, such as geothermal.

5. Other National Activities

5.1 Geothermal Education

GEOPLAT is the entity in charge of carrying out official geothermal training in Spain, whose aim is the certification of training with European recognition in order to promote safe, secure and sustainable development within the Spanish geothermal sector. In 2016, the second course of formal training in Design of Geothermal Exchange Systems was made, in collaboration with the International Association of Geo-Education for a Sustainable Geothermal Heating and Cooling Market (GEOTRAINET), which was well received by industry (http://cursogeotermia.geoplat.org/). It will be held every year in the future, in line with the pursuit of excellence of geothermal energy in Spain, which is the driving force behind all actions of GEOPLAT.

5.2 Conferences

- GEOPLAT Assembly 2016 (Madrid, 18 November 2016) http://blog.geoplat.org/2016/11/25/asamblea-geoplat-2016-documentacion-disponible/

- Participation of GEOPLAT in the 13th National Congress for the Environment CONAMA 2016 (Madrid, 28 November to 1st December 2016).
    - Organization and participation in the technical workshop: '*Climate change or renewable energies?*' http://www.conama2016.org/web/generico.php?idpaginas=&lang=es&menu=402&id=334&op=view
    - Presentation of the GEOPLAT technical paper (poster): '*Geothermal energy in Spain, enormous accessible potential*' http://www.conama11.vsf.es/conama10/download/files/conama2016/CT%202016/Paneles/1998971908_panel.pdf

5.3 Publications

- Análisis del sector de la energía geotérmica en España (GEOPLAT, December 2015) http://www.geoplat.org/setup/upload/modules_docs/content_cont_URI_1980.pdf

- Síntesis del Estudio Parque de Bombas de Calor en España (IDAE, 2016) http://www.idae.es/uploads/documentos/documentos_Bombas-de-calor_FINAL_04ee7f42.pdf

- GEOPLAT Yearbook 2016 http://blog.geoplat.org/wp-content/uploads/2017/06/GEOPLAT-Anuario-2016.pdf

5.4 Useful Websites

- GEOPLAT Website: www.geoplat.org
- GEOPLAT Blog: http://blog.geoplat.org
- Spanish Institute for Diversification and Saving of Energy (IDAE): http://www.idae.es

6. Future Activity

The Spanish Geothermal Technology Platform (GEOPLAT), jointly with the National Institute of Qualifications of the Spanish Ministry of Education (INCUAL), has begun to develop the basis for qualification of professionals to manage the installation and maintenance of heat exchange geothermal systems. This qualification will serve to create advanced vocational training courses as well as vocational training courses for the unemployed. In addition, it will officially accredit experienced installers with the corresponding title. This official qualification will help to advance the professionalization of the sector, which implies an extension of the knowledge to install this type of renewable heating and cooling system, guaranteeing quality standards in the installations.

7. References

- 2016 Census on the existing DHC networks in Spain (ADHAC): http://www.adhac.es/Priv/ClientsImages/AsociacionPerso8_1476438639.pdf
- CORDIS - Community Research and Development Information Service http://cordis.europa.eu/
- National Institute of Qualifications of the Spanish Ministry of Education (INCUAL) https://www.educacion.gob.es/educa/incual/ice_incual.html

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