Turkey's Geothermal Success

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ABSTRACT

[Turkey has achieved important geothermal developments in last 15 years. Since the 1960's, more than 240 geothermal fields have been discovered in Turkey.

Geothermal direct-use applications have reached 3322 MWt geothermal heating including district heating (1033 MWt), 4,3 million m^2 greenhouse heating (820 MWt), thermal facilities, hotels etc heating 440 MWt, balneological use 1055 MWt, agricultural drying 1,6 MWt) and heat pump applications (42,8 MWt).

Geothermal electricity production is 1182 MWe (2005 de install capacity) 15 mwe (Aydin-Germencik, Aydin-Salavatli, Manisa-Salihli, Manisa-Alaşehir, Denizli-Kizildere, Aydin-Hidirbeyli, Canakkale-Tuzla, Aydın-Pamukören, Aydin- Gumuskoy and others) as of September 2018. Liquid carbon dioxide and dry ice production factories are integrated to the Kizildere and Salavatli geothermal power plants. Recently, Buharkent (Aydin) geothermal power plant has been started to operate with 13,8 MWe install capacity. Buharkent is a non artesian geothermal field, whereas the static water level is at - 260 m depth.

The issued geothermal law and incentives contributed to the increase in geothermal electricity production investments within Turkish private sector. Beside of the hydrothermal system utilization, Turkey shall give emphasize on EGS systems for future projections.

The Turkish Geothermal Association is giving emphasize and advise on the continuing of the feed in tariff which will end at the end of 2020.

Geothermal power plants are base load plants. The highest value in base load is 99,4% in Germencik geothermal power plant (44,7 MWe).

The total hydrothermal possible theoretical geothermal heat potential is 60.000 MWt according to heat flow maps, measured well depth temperatures and calculations made for 3 km depth.

Turkey's total geothermal electricity production potential (hydrothermal, 0-3 km) can be pronounced as 2000 MWe (16 billion kWh/year) with existing 10,5 USDcent/kWh incentive.

The technical and economical EGS geothermal electricity production potantial has been projected as 15.000 MWe if the 15 USDcent/kWh incentive with minimum 15 year purchase guarantee would be possible.

REFERENCES

Journal articles: Turkish Geothermal Association circular, August 2018