Geothermal District Heating Development

Thorsteinsson, H.H. and Tester, J.W.
Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA, 02139, USA

ABSTRACT

The first U.S. geothermal district heating system, built in Boise, Idaho in 1892, is still running strong and currently serves about 275 customers. Yet its early start up did not lead to the kind of growth one might expect in a country with such high demand for heating homes and buildings. Currently in the U.S., after over a century of development in the sector, there are only 21 operating Geothermal District Heating Systems (GDHS) providing about 100 MWt. The systems were developed in the 1980s or earlier with the exception of three systems developed in the last five years. The slow growth of the U.S. GDHS sector has been in sharp contrast to what happened in Iceland where the first GDHS was built in the 1930s and now about 90% of the country's space heating needs are supplied by geothermal energy (Icelandic National Energy Authority, 2006).

This presentation will describe the results of an analysis aimed at understanding why growth in the U.S. GDHS sector has been so slow after a successful start early on. There are several potential reasons for this slow expansion – in part because other low cost fuels such as natural gas and fuel oil were readily available and because energy efficiency and use of renewable energy has not been consistently supported with government policies or incentives. Through interviews with current U.S. geothermal district heating systems operators, data were collected that provide a good overview of the status and market environment of U.S. GDHS. As a part of this study, recent cost experience in this sector was evaluated and the total cost of large scale deployment was estimated. To assess why the Icelandic GDHS sector developed much faster than then American one, the Icelandic experience was compared with U.S. experience and differences in government policies reviewed. Finally the GDHS opportunity presented by Engineered Geothermal System (EGS) was briefly explored. Analysis of the data collected was used to identify barriers and enablers of GDHS development in the U.S. to develop recommendations of how to encourage growth in the sector.

REFERENCES

National Energy Authority. (2006). Energy in Iceland. Retrieved March 22, 2008. from http://www.os.is.