Developing the Untapped Potential of Geopressured-Geothermal Energy Resources in the Gulf Coast

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EXTENDED ABSTRACT

Technological development and a suitable economic climate are critical factors for commercial development of untapped energy resources. It has long been known that the gulf coast geopressured-geothermal area has a vast potential of recoverable natural gas from co-produced brine from oil & gas operations which could potentially be used to generate electricity. Resource estimates by various researchers range from 150 to 5000 trillion cubic ft (TCF) of recoverable natural gas and potentially up to 11,000 quads of thermal energy (John et al., 2006). Green and Nix (2000) have provided a summary of the geothermal resource estimates of the United States. A resource research program conducted by the U.S. Department of Energy from 1975 to 1992, which included the testing of 17 wells, four of which were drilled and the others denoted by industry, proved the workability of the concept that a binary geothermal generation system that used produced hot brine and gas extracted from it could reliably generate electricity, but was not economic at that time. Recently this premise was successfully tested at the Rocky Mountain Oil Test Center in Wyoming. Similar pilot test projects are now being conducted by various companies (Gulf Coast Green Energy in Louisiana and Ormat Technologies in Nevada, North Dakota, and Texas). The technology for binary geothermal energy production from co-produced fluids from oil and gas fields is still in various phases and types of development and could only become economically profitable when the current availability of low priced gas from shale plays decreases resulting in appropriate cost increases. Just as the shale resources in the country were not exploited until the fracking technology was developed and found to be successful and economically feasible industry interest in large scale development of this resource depends on technology which would make it economic and profitable to develop. During the course of the Department of Energy Gulf Coast research program, one of the wells tested was located in Cameron Parish, Louisiana (Fig. 1). A summary description of this well and the Department of Energy testing program can be found in the report by John et al. (1998). The Louisiana Geological Survey has further researched this potential area in southwest Louisiana for further testing regarding the commercial viability of the resource. A structure map was generated for this area and is shown in Figure 1. Cross sections and a sand isopach map for this area are shown in Schulingkamp et al. (2012). Further work resulted in the generation of three depth temperature maps pinpointing preferential areas for potential drilling and testing for economically feasible electrical energy production using currently available generators. One of these isothermal maps for a depth range of 12,500 ft to 14,999 ft is shown in Figure 2. The two other maps constructed for depth ranges from 15,000 ft to 17,699 ft and greater than 17,500 ft have details which are not clearly legible to be reproduced at the scale of this publication, but they will be displayed at a larger scale at the poster session.

… (Note: The full version of this extended abstract, including complete text, illustrations, and references, will be made available at a later date on both the 2014 GCAGS convention website [www.gcags2014.com] and AAPG Search and Discovery website [www.searchanddiscovery.com]).