GEOTHERMAL PIPELINE

Progress and Development Update
Geothermal Progress Monitor

MEETINGS

Geothermal Resources Council Annual Meeting, San Francisco, September 24-27, 2000

The Geothermal Resources Council will hold their annual meeting at the Hyatt Regency San Francisco Airport Hotel from September 24 to 27, 2000. The conference theme *"Ushering in a Geothermal Millennium"* focuses on issues of special interest to the worldwide geothermal community. In addition to the standard sessions , there will be an innovative Special Session on Commercial Technologies featuring papers by development companies on operations and maintenance, and by vendors on services, equipment and technologies. Other special sessions include Coso Resource Development, Enhanced Geothermal Systems with presentations covering recent Japanese, European and Australian research encouraged, Geysers Resource Development, Long-Term Field Performance, Mexico and Latin America, Plant and Field Enhancements, and Power Marketing. The meeting will also include Workshops and Field Trips. The deadline for the submission of a draft paper is April 28 and the final revision is due by June 16 after review by the Technical Program Committee. Requests for additional information can be obtained from the GRC office, PO Box 1350, Davis, CA 95617-1350, phone: (530) 758-2360, Fax: (530) 758-2839, email: <grc@geothermal.org> or the First Announcement and Call for Papers can be accessed from their web site: <www.geothermal.org>.

World Geothermal Congress 2000, Kyushu - Tohoku, Japan, May 28 - June 10, 2000

The World Geothermal Congress 2000 will be held in Beppu on the island of Kyushu from May 30 to 2 June and in Morioka on northern Honshu from 5 June to 7 June. A transfer program, funded by the Japanese Organizing Committee will be provided for all registered participants between the two venues on June 3 and 4. The main purpose of WGC2000 is to provide a forum for exchange of scientific, technical and economic information on geothermal development. Field trips and Short Courses are planned before and after the meeting. The short courses are: (1) Long-term monitoring of high-and-low-enthalpy fields under exploitation, (2) Project management and financing, (3) Heating with geothermal energy: conventional and new schemes, and (4) Environmental safety and health issues in geothermal development. An extensive social program is also planned. Additional information can be obtained from the official web site: <www.wgc.or.jp> and registration can be made by email at: <wgc2000reg@ics-inc.co.jp>.

Kazuno Geo-Friendship Forum, Kazuno, Tohoku, Japan, June 3-4, 2000

A separate program in conjunction with WGC2000 will be held at the Hotel Kazuno, Kazuno City, Akita Prefecture near Morioka from June 3 to 4. Participants from all over the world will exchange information about the multipurpose uses of geothermal energy, environmental conservation etc., and discuss the direction of geothermal development in the 21st century. They will also have a chance to tour geothermal facilities in the region, and enjoy the natural scenery, history and culture of Kazuno. The Kazuno Carnival will be held the evening of June 3, field trips to Sumikawa and Onuma power plants and Goshogake Hot Springs will take place in the morning of June 4 and the technical session held in the afternoon. Transfer will be provided to Morioka for the start of the second half of the WGC2000 venue on June 5. Additional details can be obtained from the WGC2000 web site.

ENERGEX 2000, Las Vegas, NV, July 23-28, 2000

The ENERGEX 2000, the 8th International Energy Forum will be held at the Riviera Hotel and Convention Center in Las Vegas, NV from July 23 to 28. The conference will give an overview of the most recent developments in energy technologies and commercialization. This program will bring together research scientists, engineers, managers, and manufacturers from a broad range of energy companies, industries, government departments, consulting firms, research institutes, and investment firms. A geothermal session will be held under the Renewable Energies topic. Additional information can be obtain from their web site: <www.GlobeEx.com>.

CALIFORNIA

Mineral Extraction Plant to be Constructed in the Imperial Valley, CA

Construction of a mineral extraction plant by CalEnergy Operating Corporation, a subsidiary of the MidAmercian Energy Holding Company was started in the Imperial Valley last year. The facility will be the first and only facility in the world specifically designed to harvest minerals from high-temperature geothermal brines. The Zinc Recovery Project technology of zinc extraction involves the use of ion exchange, solvent extraction and electrowinning to extract and plate minerals from geothermal fluid used to generate electricity at the existing Imperial Valley facility. The extraction process was first tested on brine in Alaska in 1995. It was then tested on a larger scale through the

successful operation of a demonstration project which started in early 1996 and ended in late 1997. The project is projected to recover an estimated 30,000 metric tons (33,000 U.S. tons) of zinc per year. Using 18 to 20 million pounds/hour brine from eight power plants operated by CalEnergy Company (400 MWe), 550 to 600 ppm of zinc will be extracted. Power from the new Unit 5 (55 to 60 MWe gross) will provide 20 to 22 MWe for the extraction process. The current market value of zinc is around 55 cents/pound. In addition to the zinc recovery by the $280 million plant, high grade silica and manganese will also be extracted from the geothermal brine. The project will add 70 to 90 full-time jobs to Imperial Country. To help in the research efforts, the company is receiving a matching grant of $904,340 from the California Energy Commission's geothermal program. Commercial operation is estimated to commence by mid-year. (CalEnergy web site and CEC Media Advisory release).

MEXICO

Mexico to build 100-megawatt Geothermal Plant

Mexico plans to construct a 100-megawatt geothermal power plant in the Mexicali Valley to provide electricity to the Baja California peninsula and the state of Sonora. The Cerro Prieto IV plant will be the second largest in the world, making Mexico as the third-largest producer of geothermal energy by the Federal Electricity Commission (CFE). The new plant will bring Mexico's geothermal electricity capacity to 853 megawatts, according to Dr. Gerardo Hiriart, CFE's chief of Geothermal Projects. The time and cost of completion is not reported. Mexico needs to add an additional 13,000 megawatts of generating power by 2007 to satisfy growing demand. Energy demand is growing by 10 percent a year in some parts of the industry-heavy north and the need for extra megawatts will soon outstrip the government's means to provide them, according to industry analysis. Mexico has a current power capacity of 32,000 megawatts. (Reuters, Feb. 13).

WASHINGTON, DC

GeoPowering the West - National Geothermal Initiative for Western States

On January 24, in an effort to tap the vast geothermal resources of the western United State, Secretary of Energy Bill Richardson and U.S. Senator Harry Reid of Nevada announced a new Department of Energy (DOE) initiative to expand the production and use of energy generated from heat within the earth. The new initiative, known as *GeoPowering the West*, will help bring geothermal electricity and geothermal heat to millions of homes and businesses in the west.

The strategies for *GeoPowering the West* are:

- Increase the use of geothermal for electricity production, through identification and development of new sites, expansion of existing reservoirs, strengthening of technology development efforts, and an effort to tap more-localized resources for small-scale distributed power.
- Use the largely untapped lower temperature resources that are broadly available across the Western states to supply heating for residences and commercial establishments, and for industrial process applications.

The initiative will build on current and future public and private sector efforts to help bring geothermal electricity and geothermal heat to widespread portions of the West and expand its use from Albuquerque to Seattle. *GeoPowering the West* will focus on three major goals:

- Supplying at least 10 percent of the electricity needs of the West by 2020 with 20,000 megawatts of geothermal energy installed.**;**
- Supplying the electric power or heating needs of at least 7 million U.S. homes through geopower by 2010; and
- Doubling the number of states with geothermal electric power facilities to eight by 2006.

New technology under development or now available for geothermal reservoir discovery and recovery will allow for expansion of geopower under development in these states and throughout the entire west.

The initiative supports the DOE plan to have 25,000 megawatts of wind, solar, geothermal and biomass renewable power generating capacity on-line by 2010. On hundred megawatts of geothermal energy provides the residential electricity needs of a city of 200,000 people. In addition, it supports the Western Governor's Association and Western Regional Air Partnership's goal of increasing the contribution of non-hydro power renewable energy to regional electricity needs to 10% by 2005 and 20% by 2015 as a means of reducing pollution in the west.

GeoPowering the West will be a partnership of organizations from both the private and public sectors, representing suppliers, users and the environmental community. The initiative will provide an opportunity for participation to Native Americans, the agricultural community, rural America, and federal facilities. A draft action plan is available at the DOE web site: <www.eren.doe.gov/geopoweringthewest/>. Comments will be taken through April 2000 and incorporated into the initiative's final action plan.

Over $4.8 million will be awarded for geothermal activities in six western states. This includes approximately $4.4 million recently awarded for geothermal reservoir technology research, development and demonstration. The research activities are directed towards the domestic use and development of new technologies for geothermal reservoir exploration, characterization and management. This research will provide developers information on identifying the size of the resource, how good the resource is, and how best to keep the resource viable. Seven awards were made to the following institutions: University of Utah, University of North Dakota, Southern Methodist University, Dr. Denis L. Norton of Idaho and Geomechanics International, Inc. of California.

As much as $400,000 will be awarded for enhancements to geothermal power projects. Two projects have been selected in California for further contract negotiations. These projects will reduce maintenance and operation cost for geothermal power plants and will improve energy production. The selected recipients are Northern California Power Agencies (consisting of 10 municipal power agencies) in Middletown, California and Thermochem, Inc. in Santa Rosa, California. (U.S. Department of Energy News)

New Directions for the DOE Geothermal Program

During the current fiscal year (FY2000) the DOE Geothermal Program is shifting its focus from laboratory based R&D that results in technology improvements to field verification projects that result in the deployment of new technologies. This change in focus will emphasize cost-shared field tests with industry, and the laboratory and computational research that supports field verification. The requested budget for fiscal year 2001 will reflect the change in direction.

A new structure is being used to organize the geothermal program. All aspects of this structure will place strong consideration on cast-shared, joint projects with the geothermal industry. The major components of the new struc-ture along with a tentative proportion of funding is as follows:

- Energy Systems Research and Testing (32% of budget);
- Geoscience and Supporting Technologies (46% of budget); and
- Drilling Research (22% of budget)

This structure of the Geothermal Program takes advantage of previous and continuing research projects while providing flexibility for new initiatives. Emphasis on field verification places a stronger reliance on industry cost-shared joint projects to test new technology under actual operating conditions in geothermal fields. (Marshall J. Reed, Proceedings of the Twenty-Fifth Workshop on Geothermal Reservoir Engineering, Stanford University, Jan. 24, 2000).