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STATUS REPORT - GEOTHERMAL OPERATIONS RESEARCH PROJECT
FOR CALIFORNIA AND HAWAII

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The purpose of this paper is to present a status report on a U.S. Department of Energy Geothermal Contract No. ET-78-C-03-1529. The objective of the Geothermal Operations Research Project is to develop, update and refine realistic scenarios for the development and commercial utilization of geothermal energy resources in California and Hawaii. To ensure achievement of the potential of the regional scenarios, it is necessary to evaluate the potential regional contributions to the national energy goals, as well as identify the type, magnitude, and scheduling of Federal, State and local, public, industrial and commercial actions needed at the present time and in the future.

During the initial period of the contract, the primary effort has been concentrated in the following activities:

- developing a site-specific electric scenario at Heber, CA, and Puna, HI;
- making contacts and participating in meetings within the geothermal community; and
- developing a technical basis and rationale for approaching direct use scenarios.

At the Project Review Meeting in Sacramento on March 6th, the first-order electric scenario for Heber was presented. The purpose of this scenario is to:

1. provide a planned time sequence for bringing power on-line;
2. lay groundwork for monitoring;
3. bring all pertinent parties into the planning process; and
4. identify actions needed by all parties in order to actualize the potential of the prospect.

Under present industry planning, the Heber area is likely to be the first

liquid-dominated resource at which commercial scale power production begins (50 MW or more). The first power plant on-line can be expected at Heber in early 1981. Ideally, additional power plants on the order of 50 MW in size should be achieved in 1982 and thereafter, leading to the installation of up to 300 MW by the end of 1985, and full development of the field to 1000 MW installed capacity in the mid 1990's. One thousand MW is taken as a conservative figure for full field development in view of resource potential estimates of 100 to 2000 MW for 30 years.

In developing this scenario, geophysical, technical, environmental, regulatory, economic and financial requirements for development have been examined. Certain key requirements for achievement of this scenario have been identified and programmatic recommendations prepared accordingly. Without these, delays in the completion of power plants will begin to develop in the 1979-1980 time frame and amount to 2 to 3 years in duration by the late 1980's.

The preliminary recommendations resulting from the analysis of the Heber scenario are shown in Table I, including the beneficial impact on the scenario of each recommendation and the date by which each action is necessary to avoid delaying the scenario. Further analysis and refinements of the scenario are likely to result in additional suggestions; however, the items in Table I will remain as major needs requiring action fairly soon if geothermal development at Heber is to progress rapidly.

In addition to completing the Heber electric scenario, work is continuing on the direct use scenario and an electric scenario for Puna, HI (results to be presented at meeting).

Some of the pertinent highlights of the Puna scenario are resource assessment, utilization of the power produced,

Table I. Summary of Heber Programmatic Needs

RECOMMENDED ACTION	BENEFIT IN HEBER SCENARIO	DOE ROLE	SUGGESTED LEAD AGENCY	DATE NEEDED
EXPAND IMPERIAL COUNTY PLANNING OFFICE CAPABILITIES.	ELIMINATION OF DELAYS OF UP TO TWO YEARS.	FUNDING GRANT OF IMPERIAL COUNTY	DOE AND CERCDC	LATE 1978 TO EARLY 1979
DEFINE CERCDC ROLE	REDUCE INDUSTRY UNCERTAINTY. PREVENT CREATION OF NEW DELAYS.	N/A	CERCDC	1979
PROVIDE TAX INCENTIVES - INVESTMENT CREDIT - DEPLETION ALLOWANCE - INTANGIBLE COSTS WRITEOFF	ENCOURAGE NECESSARY INDUSTRY COMMITMENT. GREATEST IMPACT IN THE NEAR-TERM BENEFITS BOTH UTILITY AND FIELD DEVELOPER. STRONG IMPACT. ENCOURAGES FIELD DEVELOPERS TO ACCEPT RISKS. SMALL IMPACT. PRIMARILY BENEFITS FIELD DEVELOPER.	SUPPORT NECESSARY LEGISLATION	CONGRESS	EARLY 1979
SETTLE MAJOR QUESTIONS REGARDING PROVISION OF COOLING WATER	ESSENTIAL FOR PERMITTING OF POWER PLANTS.	INITIATE DISCUSSIONS WITH ALL AGENCIES INVOLVED.	DOE	MID-1980
PROVIDE FOR IMPROVED SEISMIC BASELINE FOR HEBER	PREVENT POSSIBLE LONG DELAYS IN FUTURE.	PROVIDE FUNDS IF NECESSARY	USGS	1978 OR 1979

permitting requirements, recently enacted State geothermal regulations, county-State aspects, the current state of pertinent projects such as the wellhead generator, possible direct uses, and the environmental and sociological aspects of the development of geothermal energy.

Seven tasks have been identified which constitute the scope of the Geothermal Operations Research Project. They are:

1. refining and updating the preliminary regional geothermal energy development scenarios;
2. developing a regional progress monitor;
3. performing market analysis;

4. constructing institutional and financial profiles;
5. generating cost/benefit analyses and cost-effectiveness analyses of Federal and State government measures;
6. developing a local area cost/benefit analysis; and
7. providing support to DOE-DGE, the regional systems development contractor and the national operations research contractor.

A status report providing an update of the activities of the SAI Geothermal Research Staff will be available at the Geothermal Resources Council meeting to be held in Hilo, HI, on July 25-28, 1978.