The Current Status of the Geothermal Loan Guaranty Program

Vito A. Magliano, Director
Geothermal Loan Guaranty Program

U.S. Department of Energy
Oakland, California

The common ingredient in all these applications is that the project must provide a reasonable assurance of being able to repay the guarantied loan. Any private or public organization that has an interest in geothermal energy can qualify as a borrower, including property owners, developers, utilities, other producers of electrical energy, and users of geothermal energy for non-electric projects.

We are able to guaranty up to $100 million per project and $200 million per borrower. For direct use projects, the maximum guaranty is $50 million. We can guaranty up to 75 percent of the project, and the borrower must provide equity of at least 25 percent of the project costs. These costs, however, can include previous expenditures, and additional equity can be contributed proportionately during the development or construction phase of the project. We can guaranty loans for up to 30 years. At present our loan guaranty authority is $350 million, and we have requested an additional $200 million in the 1981 budget.

Our application evaluation process starts with preliminary discussions with the borrower and the lender. After submission of an application, we do a quick review to determine that it is complete and includes all the necessary information. We then proceed with a detailed evaluation which covers seven key areas: resource, engineering, marketability, financial, management, environmental, and legal.

The first area we look at is the resource: What are the expected characteristics? What is the temperature, flow, chemistry and reservoir magnitude? The U.S. Geological Survey and private consultants will assist in this evaluation. When the potential characteristics are defined they are given to one of our engineering consultants. The characteristics are analyzed to determine engineering feasibility, to design the utilizaion process, and to validate estimated costs. The next step is a market analysis to determine if the end product is marketable and if so, at what price.

The Geothermal Loan Guaranty Program is one of several DOE initiatives to accelerate the commercialization of alternative energy sources. The program's objectives are: first, to encourage and assist the private and public sectors to accelerate the commercial utilization of geothermal resources by minimizing the lender's financial risk; second, to develop a financial service infrastructure to ultimately provide financing of geothermal projects without federal assistance; and third, to promote competition and encourage new entrants into the geothermal market. The development of a financial service infrastructure is important because our program has a limited life -- only four more years. At the end of this period we hope the industry will be self sufficient.

Within DOE, the Assistant Secretary for Resource Applications is responsible for the administration and management of the program. Her staff establishes policy and takes action on Operations Office recomendations. Nationwide responsibility for the implementation of the program has been assigned to the Manager of the San Francisco Operations Office. Under the Manager of the San Francisco Operations Office, the Office of Geothermal Loan Guaranty Program receives and evaluates applications and monitors approved guaranties.

Geothermal loan guaranties can be made for:

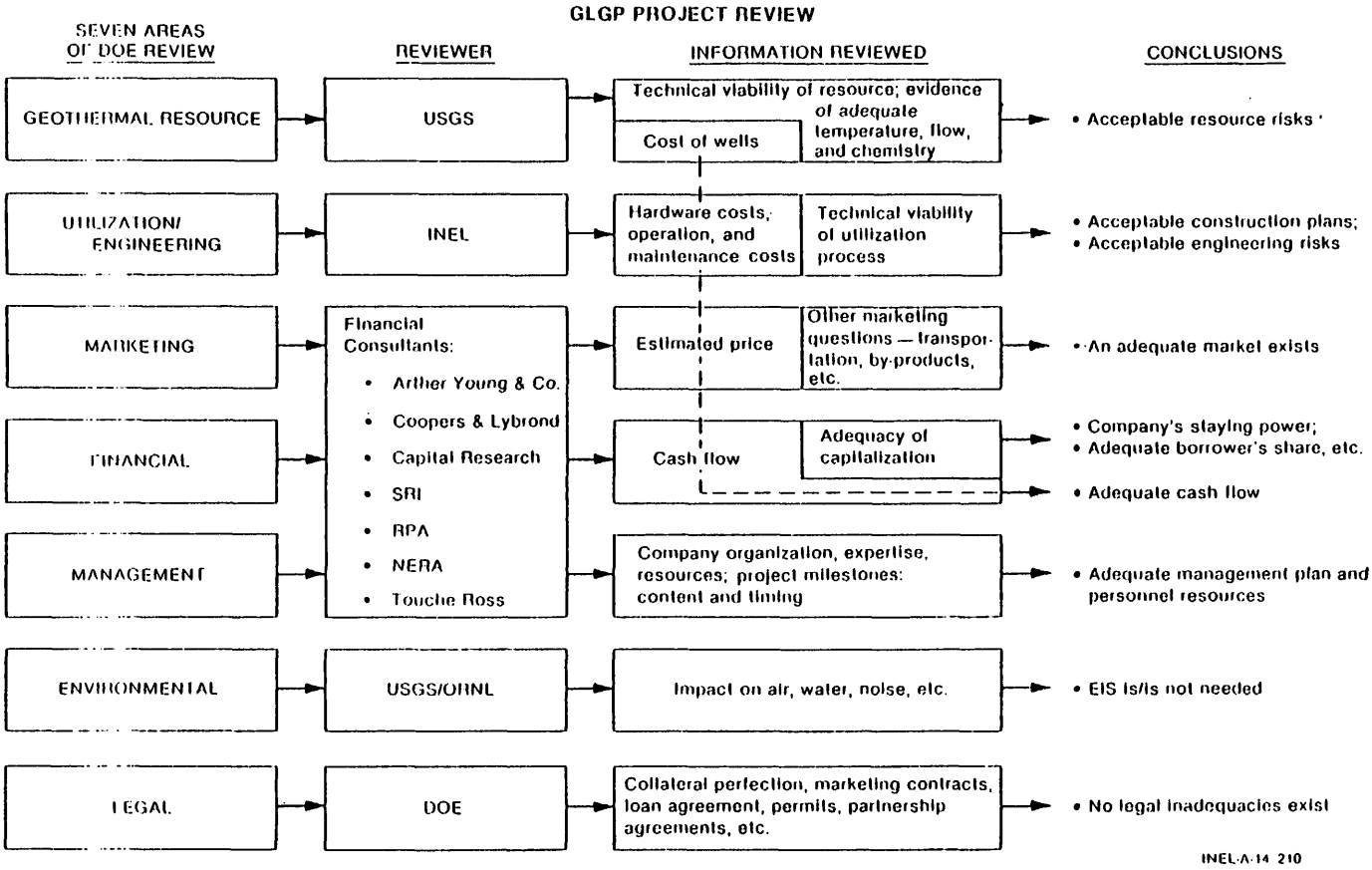
1. Evaluation of the commercial potential of a resource.

2. Research and development dealing with extraction and utilization methods.

3. Acquisition of rights in geothermal resources.

4. Construction and operation of facilities for the production of electricity from geothermal resources and;

5. Construction and operation of facilities which use geothermal resources in non-electric applications.



We now have the basic ingredients of a typical cash flow analysis -- cost and revenues. The cash flow analysis is a key part of our evaluation since we must determine its sufficiency to cover the debt service requirements of the guarantied loan. Our management evaluation is directed at the proposed organizational structure, the firm's or partner's financial standing, and the interrelationships and experience of key management personnel.

All of our projects must be environmentally sound and DOE performs an environmental review. The extent and the nature of the review varies with each project.

Finally, the application and related documents are reviewed for legal sufficiency. A determination is made that the proposed project complies with DOE and other federal regulatory and statutory requirements. These requirements, for the most part, are contained in our regulations and enabling legislation. Other areas, such as acceptability of loan agreement terms and conditions, security interests in collateral, legality of the proposed business organization, and compliance with state and local permitting requirements, are also examined. Careful analysis of the risks in each of the above areas is made in order to reach the bottom line determination -- reasonable assurance of payback. Due to the many uncertainties associated with development and use of a geothermal resource, the determination of reasonable assurance of payback is often complex.

What is the status of the Geothermal Loan Guaranty Program? On balance it looks good. We have approved five guaranties with total project costs of $93 million and follow-on commitments of $153 million. Four additional applications are under review with guaranty requests of $114 million. In summary we have approved, committed or under review projects which, if all are approved, exhaust our $350 million authority. With possibly only $200 million in authority for fiscal year 1981, we are faced with allocating those funds on a priority basis. We will be putting a high priority on those projects which provide us with the greatest leverage in terms of stimulating private sector development. For example, an electric generating project in an undeveloped resource area would provide more leverage than

SUMMARY: GEOTHERMAL LOAN GUARANTY APPLICATIONS

CATEGORY	NUMBER	GUARANTY AMOUNT ($M)
APPROVED PROJECTS	5	92.8
APPLICATIONS UNDER EVALUATION	4	114.1
PRE-APPLICATION DISCUSSIONS	15	396.8
TOTAL	24	$603.7

APPROVED PROJECTS

PROJECT	TYPE	COST (MILLIONS)	GUARANTY (MILLIONS)
EAST MESA/R-1975 (RGI)	FIELD DEV. (ELECTRIC)	$17.9	$ 9.00
CU I VENTURE	EXPLORATION (ELECTRIC)	2.8	1.8
CU I VENTURE	FIELD DEV. (ELECTRIC)	78.8	49.4
GEOTHERMAL FOOD PROCESSORS	VEGETABLE DEHYDRATION (NON ELECTRIC)	4.8	3.5
WESTMORLAND	FIELD DEV. (ELECTRIC)	41.0	29.1
		$145.3	$92.8

one in a resource area already under development with nonguarantied private sector financing. In non-electric projects we will be looking at the potential for additional industrial application of the process at the proposed site and at other locations throughout the United States.

It may be helpful at this point to describe some of our projects. The first is the Geothermal Food Processors, a vegetable dehydration plant at Brady Hot Springs, Nevada. The plant is the first vegetable dehydration plant to use geothermal energy in the U.S. It is capable of processing 30 million pounds of raw onions per year as well as other vegetables such as carrots, celery, bell peppers, chili peppers, and potatoes. Geothermal fluids are used in place of natural gas, as process water, and heat for the plant operations. It is estimated that the company will save $1.8 million in fuel costs over the next 15 years. Although delayed completion of the plant resulted in the company experiencing some financial difficulties, the company acquired additional equity capital and DOE increased the loan guaranty to provide additional financing to complete the plant and start operations last year.

An example of an early electric project is Republic Geothermal's field exploration project at East Mesa. With the Bank of America providing the financing, the objective is to demonstrate the economic viability of producing electricity from hot water underlying the East Mesa area of the Imperial Valley. We expect to receive two supplementary applications to complete the project: one to build a 64 gross megawatt double-flash power plant, and the other for an expanded field to support the plant. At this time it appears the East Mesa project will result in the first privately financed hydrothermal power plant in the country over 10 megawatts. We believe this project will be a significant demonstration of the viability of a moderate-temperature hot water resource for producing electricity since East Mesa temperatures and flow rates are both at the low end of the commercial range. It also demonstrates the viability of the Loan Guaranty Program. Through the use of the loan guaranty, Republic will be able to privately finance all phases of the project. Because of the initial high risk, private financing would not have been available without the guaranty.

At this stage of development in the geothermal industry nothing seems to go as planned. In order to be a viable financial incentive the Loan Guaranty Program must be able to respond to changing technical and economic conditions. The McCulloch Oil and Geothermal Kinetics exploratory drilling project at South Brawley, California is a recent example. At the time the loan was closed, DOE, the borrower, and the lender -- the Bank of Montreal, California -- all were in agreement as to what success criteria should be for the first well in terms of temperature, flow rate, and fluid chemistry. Upon completing the well a collapsed casing cut the well test short and prevented us from determining whether the criteria had been met. Rather than stop the project DOE agreed to increase its risk by allowing the borrowers to draw down the balance of the guaranteed dollars to clean out the well and make a better determination on the viability of the resource. Our perseverance has paid off. The well was completed with very promising results. The well was tested at approximately 75,000 pounds of steam per hour with a narrow diameter casing. From draw down tests, the borrower believes that the well may be capable of delivering at or above 200,000 pounds of steam per hour. Wellhead temperatures were measured at 422 F. This past April DOE approved the borrower's application for full field development of the resource for a 55 MW power plant.

The last project I would like to talk about is the Northern California Power Agency's proposed power plant at The Geysers. The project provides for a 110 megawatt plant to be located in the Castle Rock Springs area of The Geysers. The Bank of Montreal, California will provide the initial construction financing. Estimated costs are approximately $58 million. We will guaranty about $44 million. DOE signed a memorandum of understanding with the State of California and other Federal agencies to conduct a joint environmental review. The joint effort approach is a landmark and will in my opinion result in a more effective and speedy environmental review process. We hope the cooperative approach will be the wave of the future.

What about the future? We are currently in the process of implementing several initiatives to make the program more attractive. Our efforts focus around three areas: legislative changes, revised regulations and the issuance of loan guaranty policy guidelines and management procedures.

Our initial legislation was amended in February 1978. These amendments provide several provisions which are designed to make the program more attractive to lenders and borrowers. For lenders, we can pledge the full faith and credit of the United States on the payment of principal and interest. For the borrower, we can now lend up to a maximum of $100 million per project and $200 million in total. We have authority to provide the borrower with both principal and interest assistance under certain conditions. For those representatives of public agencies, we now have the authority to allow interest differential payments. We cannot guaranty tax exempt financing as the interest from our guaranty loans must be taxable, however, a new interest differential provision allows us to pay a portion of the difference between the taxable interest rate of the loan and the market yields on other tax exempt obligations of the borrower.

In December, 1979, we published revised regulations to incorporate the legislative changes, and to correct certain problem areas identified

from our past experience. These changes are designed to enhance the attractiveness of the program. We have tried to facilitate the marketability of guaranteed securities by clarifying and changing several sections of the regulations. A provision has been added allowing holders of long-term notes as well as lenders to make demand for payment in the event of default under the loan. We have the ability to borrow funds from the Treasury if balances in the Geothermal Resources Development Fund cannot cover a loan for which payment has been demanded. Revisions concerning the withdrawal and reduction of a guaranty should make the guaranty more acceptable to long-term holders of the obligations. Finally, we have also made changes to bring the lenders servicing obligations more in line with their normal practices.

With regard to the borrower, we have shortened and simplified the requirements for information supporting the application. A provision has been added to assure that loan guarantees do not adversely affect the competitiveness of the industry.

Based on comments received on the proposed regulations and our recent experiences we can consider guaranties for leverage lease financing on a case by case basis. The geothermal industry is composed of two rather distinctive segments: developers and users. The developers are the resource companies which hold leases and drill production wells. Users are the companies which construct and operate the power or industrial process plant. While there has been a considerable amount of developer activity, there has not been much user activity outside of The Geysers area. We found that one reason the developer is reluctant to get involved with operation of a power plant is fear of regulation as a utility.

On the other hand, the utilities are reluctant to invest in the geothermal power plant because of the technology and resource risks associated with undeveloped geothermal resources areas. Under a leveraged lease, a third party investor usually will put up 25 percent equity and the DOE will guaranty a loan for the remaining 75 percent. Recently legislated investment tax credits make the leverage lease attractive for the equity investor. The third party equity investor will be the owner and receive the tax benefits. The utility will operate the plant as a lessee, thereby greatly reducing its risk and capital investment. The leverage lease, through the introduction of the third party investor, provides a means to tie together developer and user interests so that the geothermal resource can be developed and utilized.

The final area of our efforts has been the recent issuance of DOE loan guaranty policy and management procedures. Policy provisions include:

- DOE's acceptance of a reasonable valuation for the equity share of project costs.
- DOE's recourse will be generally limited to project assets.
- DOE's heavy reliance on lenders to evaluate the borrower's financial condition.

Management procedures are designed to shorten DOE response times, including:

- Delegation of approval authority to the field.
- Procedures to expedite headquarters level review.
- Definition of departmental organizational responsibilities and authorities.

In summary, we have taken action to make our program more attractive to borrowers and lenders. We do not plan to stop here and will continue to evaluate and improve our program in the future.