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U. S. GAO STUDIES OF GEOTHERMAL ENERGY

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ABSTRACT

The U. S. General Accounting Office recently issued three studies on geothermal energy. These studies are important for their independent criticisms of Federal Leasing and Loan Guarantee Programs, for their analysis of obstacles impeding the widespread use of geothermal energy, and for the recommendations they make. They are also important for what they do not say, e.g., they fail to study or comment on critical tax and economic issues which the private sector of the geothermal energy industry is faced with and which are major obstacles to accelerated development of domestic geothermal energy resources.

This paper urges Congress to extend mineral fuel tax treatment under IRC 617 to geothermal resources, i.e., current deduction of exploration expenses subject to recapture once development begins; to permit the current deduction of reinjection-disposal well costs; and to restore a full 22% depletion allowance.

The Comptroller General of the United States and his staff at the United States General Accounting Office, who serve as an independent investigative arm of the United States Congress, have published three important reports on geothermal energy:

1. How To Speed Development of Geothermal Energy On Federal Lands, EMD-80-13, October 26, 1979, 44 pages.
2. Geothermal Energy: Obstacles and Uncertainties Impede Its Widespread Use, EMD-80-36, January 18, 1980, 41 pages.
3. The Geothermal Loan Guaranty Program: Need For Improvements, EMD-80-26, January 24, 1980, 42 pages.

For the sake of convenience these reports shall be referred to as GAO 1, GAO 2, and GAO 3.

These reports should be considered in the context of a Staff Report prepared for the Geothermal Office of the California Energy Commission entitled "Economic and Institutional Incentives To Facilitate Geothermal Resource Development" (January 1980).

Both the CEC report and the GAO reports, however, fail to deal with the subject of the need for exploration deductions (in addition to IDC well cost deductions now permitted by IRC 263 which was added to the IRC in 1978) and the restoration of a full 22% depletion allowance (under IRC 613(e) the 22% allowance will decline to 20% in 1980, 18% in 1982, 16% in 1983, and 15% in 1984). Those reports also fail to study the chilling effect on investment that exists by reason of the extension of tax preference items (subject to the minimum tax under IRC 57(a)) to excess IDC's under Section 402 of the Energy Tax Act of 1978 and the IDC recapture provisions also provided for by that section. See generally, Burke and Bowhay, 1980, Income Taxation of Natural Resources: Prentice-Hall Inc., para. 11.02, 11.03, 14.20.

GAO 1

GAO 1 was prepared at the request of Senator Henry M. Jackson (D. Wash.), Chairman of the Senate Committee on Energy and Natural Resources, who requested the GAO to determine the reasons for the relatively slow national development of geothermal energy, and whether there was any evidence that the pace of development was being deliberately slowed.

The GAO concluded that there was no such evidence and that the reasons "are many and varied", including the slow pace of Federal leasing, the lack of priority for leasing by the Forest Service, acreage limitations, KGRA definitions, but that "the main reasons probably have more to do with economic and technological considerations" including the need for "various financial incentives and other initiatives".

The report notes that since the enactment of the Geothermal Steam Act of 1970, 1,616 Federal leases have been issued covering 2.1 million acres (133,542 in National Forests); 363 leases have been ended; and that as of June 30, 1979 there were 1,956 lease applications awaiting action (989 relating to Forest System lands); but that no commercial production has yet been established on Federal lands --- "this despite the fact that... the Federal Government owns close to two-thirds of this Nation's total geothermal resources."

The GAO concluded that it found "a consensus of both Federal and industry officials that private

officials...that private and State-owned lands alone do not have sufficient geothermal resources to support a viable industry." The GAO, however, does not identify or give the number of so-called "industry officials" who are of this view and apparently did not conduct any general survey of the industry to ascertain a cross-section of views.

Certainly, any development of geothermal resources in the Eastern United States, including the Gulf Coast, will be primarily on private and State-owned lands. See, e.g., Renner, Joel L., and Vaught, Tracy L., 1979, Geothermal Resources in the Eastern United States: Gruy Federal, Inc./ U. S. Department of Energy, Geothermal Division. The geothermal ground water heat pump industry is an established and rapidly developing sector and was not considered by the GAO. See generally, The Ground Water Heat Pump Journal: National Water Well Association, Worthington, Ohio. There are at least 25 domestic manufacturers of GWG Heat Pumps. GWG Heat Pumps: Geothermal Energy Institute.

In focusing on the lack of financial incentives and the lack of "off-the-shelf" technology, as the major impediments to geothermal development, the GAO side-stepped these issues except to observe that there was "a need to carefully consider and design new incentives and initiatives so that they can help geothermal development in the most effective and timely manner", that Loan Guarantee applications are not being processed in a timely fashion by the DOE, that investment tax credits for geothermal equipment were questionable incentives if State regulatory commissions ordered utilities to pass them through to consumers, and that the GAO "would generally favor financial incentives" which would most directly overcome economic and technological constraints "and thus promise the most development for the funds expended".

The GAO found that the following reasons were given for the slow rate of development:

1. Resource Uncertainty.
2. Lack of capital.
3. Federal agencies have assigned low priority to processing geothermal leases, especially the Forest Service.
4. Agencies lack staff and money to process leases.
5. There are too many review levels within and among Federal agencies.
6. There is too much concern with environmental matters, especially in California.
7. Federal agencies took too long to implement the Geothermal Steam Act of 1970.
8. Overlapping and sometimes conflicting requirements of county, State, and Federal regulatory agencies.

The GAO also added its general support to pending legislation which would reform Federal geothermal leasing activities (S. 1388, S. 1330, H. R. 5187, H.R. 4471, H.R. 6080). H. R. 6080 (Geothermal Resources Act Amendments of 1979) passed the House on February 2, 1980 and is now pending before the Senate Energy Committee.

The "Lack of Capital" issue is a serious one although it was not examined in detail by the GAO. The lack of adequate tax and financial incentives coupled with the probable adverse impact of the "Windfall Profits Tax Bill" which could reallocate between \$227 - 762 Billion of oil company profits from the private sector to the Federal sector, is seriously impeding capital formation in the geothermal energy industry. This paper will make a suggestion for necessary reform of the IRC after a discussion of the GAO reports.

GAO 2

GAO 2 was prepared on the initiative of the Comptroller General to follow up on a similar report issued several years ago.

Although the report complains that the Federal Government has spent nearly \$500 million over the past 5 years to support efforts to accelerate the development and use of geothermal resources in the United States without affecting the slow pace of such development and use, the GAO makes no attempt to analyze the way in which that money was spent - e.g. on long-term projects such as the hot dry rock program which are not expected to have a short-term impact on the pace of development.

The report acknowledges that "some uncertainty remains concerning the extent that (NEA) incentives will promote more widespread use of geothermal resources." The National Energy Act of 1978 (NEA), P.L. 95-618 provided for intangible drilling cost deductions (IDC's) and a percentage depletion allowance (declining from 22-15% by 1984) as well as for residential user tax credits and a 10% business investment credit.

But as is obvious from the lack of capital formation in the industry, these incentives tracked the oil and gas industry incentives and not the mineral fuel industry incentives which should be applied to geothermal resources. And a declining depletion allowance is certainly less attractive than a fixed rate that investors can depend on.

The report also calls attention to the Public Utilities Regulatory Policy Act of 1978 (P.L. 95-617) which authorizes FERC to order utilities to provide transmission and interconnection services for geothermal power plants that qualify as small power producers and which exempts small power producers from public utility regulation. Although the report does not refer to PUPRPA impact on geothermal pricing, producers should carefully consider possible advantages of the Act in that regard.

The GAO report concludes that while obstacles and uncertainties have impeded accelerated development of geothermal resources, another reason for the failure to accelerate development has been ERDA's and DOE's "problems in managing programs". The GAO cites the lack of formal management systems, the lack of a formal system for setting priorities, delays in issuing implementing regulations, low priorities given by DOI management to geothermal development, DOE's lack of a formal system for monitoring regulation issuance procedures and the continuing need for aggressive efforts to achieve improved interagency coordination of planning efforts.

The report also supports agency and legislative proposals to amend the Geothermal Steam Act of 1970 in order to improve the Federal leasing program, to amend the NEA and the Geothermal Energy RR&D Act of 1974.

But the report does not address itself to the nitty-gritty issues of tax and economic incentives. As one informed observer has put it:

"Lack of tax incentives at the state and federal level, combined with heavy taxes during these beginning years of geothermal development, suggests that geothermal development will remain noncompetitive and will continue at a slow pace."

Sharon C. Wagner, 1977, State Taxation of Other Energy Minerals Compared With State Taxation of Geothermal Resources: Geothermal Resources Council, Davis, California, p. 23.

GAO 3

GAO 3 was requested by Congressman John D. Dingell (D. Mich.), Chairman of the House Subcommittee on Energy because of his concern that the Geothermal Loan Guarantee Program "is not being managed as efficiently as it should be" and that "there may be misuse of federal funds due to a poorly organized and directed program, which may be giving support to fiscally unsound ventures."

The GAO report concludes that the Program has "been plagued by administrative delays due to redundant review and selection procedures" and the failure of the DOE to settle unresolved policy issues in "a timely manner". Also, that the DOE has never developed and implemented a comprehensive strategy for the Program which has resulted in "the selection of projects not meeting the program's highest priority needs" and the Program itself "has had only limited participation and effect on accelerating geothermal development."

The report notes that the DOE through FY1980 will have authority to guarantee up to \$350 million in loans and believes that these funds will be exhausted by the end of 1980. Since the Program was established in 1974, DOE has received 14 app-

lications, 4 of which have been processed and approved (\$43.4 million guaranteed), 5 of which are pending action, and 5 of which have been returned without approval. Present applications amount to about \$69 million in potential loan guarantees. Preapplication discussions have been held with 6 potential applicants whose requirements would amount to \$165 million. Follow-on guarantees to ongoing projects are expected to require an estimated \$175 - 188 million in loan guarantees (including full field development at East Mesa and plant construction at Westmoreland).

The report discusses a number of program management deficiencies and makes a number of specific recommendations for the improvement of the program. Interested readers are referred to the full report for these matters and for details on the status of approved projects.

A Proposal To Amend The IRC

A close examination of the GAO and CEC reports discloses that the authors of these otherwise highly professional reports are not familiar with and have not been exposed to the practicalities of geothermal financing projects and the impact of Federal taxation policies on geothermal development by the private sector in the United States.

Investors in energy projects are highly sensitive to the time value of money, to discounted cash flow analyses (DCF's), and to the varying tax advantages associated with varying energy projects.

In enacting the Internal Revenue Code (IRC) the Congress has historically made a fundamental distinction between oil and gas exploration and mineral fuel exploration (coal and uranium). Once an oil or gas well is drilled it can, generally speaking, be placed almost immediately on production and create revenues to return the investment made in it and a stream of future profits.

Congress has recognized that the development of a coal or uranium mine is not something that happens overnight. Consequently, IRC 617 permits mineral exploration expenses to be currently deducted subject to recapture once production begins.

GAO 3 (p.15) notes that geothermal projects "can be expected to have a 7 to 10 year lead time before useful energy will be produced" and first project revenues generated. It is precisely for this reason that geothermal exploration should be given IRC 617 treatment. It may be noted that the Geothermal Energy Resource Group of the National Research Council has specifically recommended that geothermal exploration costs be permitted to be currently expensed stating that such a federal tax policy "appears justified" "and should be effective in encouraging investment". Geothermal Resources and Technology in the United States: National Research Council, Washington, D. C., March 1979, p. 36.

It should be recognized that the IRS has aggressively resisted tax incentives for geothermal exploration and development activities.

In 1966 the IRS placed geothermal tax incentive issues in suspension where they stayed until 1976. IRS Audit Suspense Digest, November 30, 1975, No. 75-3, p. 5; IRS Audit Suspense Digest, No. 76-1, p. 2, March 31, 1976. Even then the IRS continued its opposition to geothermal IDC's and depletion. BNA Daily Report for Executives, Special Supplement, DER 140, p. 22, July 20, 1976.

Although the Congress overrode the IRS on these two issues in the NEA of 1978, it should be recognized that the IRS was successful in having excess IDC and IDC recapture penalties placed in that Act as noted on page 1 of this paper.

The IRS has continued to refuse to allow taxpayer investors to currently deduct costs of drilling exploration wells (e.g., temperature gradient and geochemical test wells) and has successfully tested that position in the Federal courts. Miller v. United States, 41 AFTR 2d 78-376 (D.C. CA., 1977). Such costs should be allowed as current deductions under a revised IRC 617 as applied to geothermal exploration.

Without such tax incentives straight-forward DCF's clearly indicate that new geothermal exploration projects cannot be competitive with oil, gas, coal, or uranium projects. Congress has the power to change this with a stroke of its pen. Hopefully, the geothermal industry can persuade it to do so.

One additional technical tax incentive is also necessary to offset IRS attacks on geothermal tax incentives. The IRS requires that geothermal disposal or reinjection well costs to be capitalized and does not permit them to be currently deducted arguing that they are not production wells even though they are a preferable means of disposing of effluents and may very well be a means of recharging geothermal reservoirs and thus permit the continuous "mining of heat". If such costs are capitalized, of course, they cannot be recovered until production goes on stream and first project revenues are realized. Only then can an investor begin to recover his capital costs through depreciation. Without a tax incentive, investors will continue to place their risk dollars in other forms of exploration (N.B. In 1979 over \$1 Billion of Oil & Gas Drilling Programs were registered with the SEC. No geothermal programs were registered).

Arguably, such wells are in effect a means of secondary recovery and thus their costs may be currently deducted - at least their IDC costs. Page Oil Company, 41 BTA 952 (1940); IRS Rev. Rul. 69-583.

Hopefully, Congress can be persuaded to permit such treatment.

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