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Social Implications That May Arise with Future Geothermal Use

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ABSTRACT

The fullest implication of geothermal heat's effect on society—when it is fully and effectively used—is not being given adequate attention. Geothermal development, especially for electrical generation, is becoming socially impeded in the USA. Governmental influences evolve.

Its effect on the social structure is not only economic in an energy dilemma, but people as a society will be increasingly involved. Geothermal energy's nature is that with nonelectric utilization (required for greatest benefit) population and industry will be forced to move, causing social pressures in an unknown degree.

Better social preparation is mandatory. The fullest use of geothermal heat may dictate drastic reorganization.

INTRODUCTION

We do not know enough about the future effects of using geothermal heat in our community of people where close relationships are involved between man, other men, and the world around us. At the risk of criticism for editorializing—we need to learn more about them if we are going to create a geothermal world.

This discussion offers no solutions. It only proposes a beginning. One can be most optimistic about the fullest and effective use of geothermal heat bringing about marvelous and long term improvements with the energy consumption and production patterns in our social environment, yet see problems around us, asking about what we know of the long term effect on people—on our society.

AROUND THE WORLD—AND HERE, TOO

The increasing interest of politicians around the world in geothermal application possibilities highlights an awakening concern in large sections of our society with numerous questions as the result. The involvement of people in social groups gives impetus to political concern, even when it is uncertain that the concern stems from a desire for profit, or merely domination. Geothermal energy's future utilization will always have a connection with politics and social interest.

POLITICAL TOOLS

The growing application of "environmental impact statements" may provide a source of some social research

material that should really evolve from actual geothermal study. They constitute more of a political implementation of moves toward maintaining a physical status quo rather than increasing knowledge of social responsibility.

The environmental impact statement approach fails to include a yet-to-be acquired understanding of the ultimate interrelationships between men and other men and the earth with regard to geothermal heat. A longer period of time is required to gauge the future results so we can predict them intelligently from experience.

TRADITIONAL APPROACH

Matters involving energy, economics, and environment are traditionally approached by governmental and corporate organizations as though they involved entirely separate disciplines rather than through a multiphase, common denominator attack, while simultaneously considering the expectations and the needs of a community of interdependent individuals which we ordinarily identify as "society."

Geothermal heat, with its concurrent energy use, has begun to mature at a time in history when the analysis of each single factor may no longer produce a satisfactory result.

If the possible effects on society are minimized when considering energy, economics, and environment in future geothermal considerations, and each factor is treated separately, then any one factor may give the wrong answer for society.

Approaches toward geothermal development can no longer be made in any state or country, underdeveloped or greatly advanced, poor or rich, on a purely technical basis. Simply driving a pipe in the ground will not do the job properly.

WHAT LITTLE DO WE KNOW?

The current petroleum crisis we are still experiencing goes on at the same time as other crises—social, environmental and economic. Politicians and economists are trying to bottle up the rising costs which have resulted, but the real increases in energy costs (and that includes geothermal) will have to be borne by society. A genuine social question concerns just how the many groups within society will bear and accept the burden of adjustment.

In western industrialized societies, the capacity to effectively assimilate relatively isolated sources of energy, like geothermal, will differ from the possibly more satisfactory adjustments in the nonindustrialized areas of the world.

That there are physical effects on some communities is now becoming evident and some responses are highly vocal. The ultimate effect of hydrogen sulfide liberation is not truly known—whether good or evil, or one merely requiring tolerance.

The effective disposition of waste fluids is not fully understood or appreciated. There are no stock solutions available for these problems. Disturbances in a neighborhood, versus a relegation of wells to a distant desert, do not provide textbook type answers and the implications become of a social nature inherent in geothermal usage in every form.

ALTERNATIVE SOURCES, COLLECTIVE NEED

Society is becoming the "fourth factor" in geothermal futures as it demands a voice in decisions with energy, economics, environment—and the future of people. The "old rules" no longer fully apply for geothermal heat, nor will they remain applicable for either the conventional fossil-type fuels, or the so-called "alternative sources," including solar heat.

The idea that solar heat use will influence our social fabric has become clearly evident to some people. A scientific task force is reported to be already working on this at the Midwest Research Institute (USA) and will prepare a full study of the prospects for solar energy with relation to its influence on society as the future unfolds.

This group has been scheduled to submit a report on the subject in August, 1975, to the Office of Technology Assessment, a Congressional agency created to give scientific advice to the legislative branches of the Government of the United States of America.

No positive evidence is at hand indicating the same concern over the future influences of geothermal heat on society in the USA. It can be said that the anticipated beneficial effect expected from geothermal is the subject of more conjecture than it was ten years ago. Amidst a welter of political, scientific and financial "backing and filling" in meeting rooms and the newspapers, the potential social profit for the people is being negated with insufficient attention to the resultant impact on the social structure, particularly in the USA.

ELECTRICAL DEVELOPMENT

A failure to effectively appraise in advance the expectations of a community at large has impeded the development of readily attainable electric power generation in certain USA areas. As if this were not sufficiently serious, some governing agencies in certain California counties are imposing, or contemplating, the imposition of moratoriums and bans for geothermal development.

In segments of the public mind, geothermal utilization has moved from eager anticipation and degraded into a begrudging acceptance or even downright opposition through social distrust. There are no truly firm plans for geothermal electric power generation in the United States at this time, except at The Geysers in California, where we have witnessed the almost total "stand-off" on approvals permitting completion of the four Pacific Gas and Electric Company stations: Numbers 12, 13, 14 and 15 with a total capacity of 406 000 additional kilowatts.

With almost ideal locations and proven steam production

fields ready for use, the obstacles are not in the energy or economic spheres, but rest largely with socially derived objections bolstered by the use of technological and environmental weaknesses used as levers.

E. S. Schwartz wrote in *Overskill* that there will always be a technological solution for any individual problem, but there can be no technological solution for the totality of all problems. At a time when there seems to be no conciliation and a trade-off for these generation unit plans, the community is expected to consume fossil fuels for a third of a million kilowatts of electrical power, each hour, each day, day after day, in spite of all efforts to reduce, conserve, remove or replace this amount of energy already demanded by an urban society.

Whether social research could have anticipated and headed off this unresolved question remains unknown because it has never been done before. The technological studies in the disciplines of energy, economics and environment simply did not touch down in the right social territory. The basic problems fester in social reaction against "big" business, "big" utilities, and against the use of electricity itself by the common people. As the result, geothermal electric power-generation growth has become almost irrevocably impeded in the western USA.

SOCIAL DILEMMA WITH ENERGY

Unanswered questions revolve about alternatives in the future energy choices. Society is going to pay in the structure of lifestyle, for certain—this is economically sure—while full geothermal use is being pushed perhaps into the next century by many negative factors. We face a dilemma with energy. It looks questionable (short of a great catastrophe) that lifestyle modifications for sufficient conservation will be accepted by people in less than a generation. Reversing an exponential growth pattern in energy use means stopping a long-term trend that simply cannot continue in a finite world.

Geothermal offers a helping hand in the dilemma, with heat as well as power, but in a limited portion of the spectrum of need. It is particularly "people-oriented," yet it also involves the natural environment in use, even when totally undeveloped. Will basic psychological forces combine with the social forces to intensify—or will they nullify—geothermal technological processes? As to what is accepted—people comprising our society will be involved with the final decisions.

GEOHERMAL ENERGY'S NATURE

Utopian visions for our social and technological structures must be infused with an understanding of the nature of man or they cannot help with meeting today's requirements. Geothermal energy has a nature of its own. It is not the inherent nature of geothermal heat to be transportable in the ordinary sense, except as electrical energy or as a product.

A "lemming-like" drive for urbanization is world-wide and it runs contrary to the regional distribution of geothermal heat in our U.S. natural environment. Work-oriented geothermal energy is not now an urban resource. The all-pervasive urge for urbanization becomes difficult to relate with a geothermal mandate for decentralized living and working, if it is to be used fully and effectively. The ultimate

technological means for total conversion and transmission to urban centers may entail too much sacrifice—in both heat and money.

The regional restricted nature of geothermal heat must ultimately result in the movement of people and industry to the earth's heat sources when other types of energy become less bountiful. This entails real social change as the heat assumes the true desirability of a valuable mineral resource. In certain places of the world we may see mining towns established near mineral production areas. They are different from some other urban areas with corporation-owned and factory-built homes, stores and business accommodations. How much do we really know about the ultimate effect on twentieth century (and twenty-first century) people—the way of life, mental outlook, the education of the children, and even their bank accounts? Is this the way for geothermal energy's future?

Is it reasonable to forecast the problems of relatively remote desert or mountain geothermal developments with homes and factories? Will these new urban dwellers monopolize the use of "their heat and power" for these settlements and deny its use to distant cities? The governor of one state that is blessed with geothermal heat stated that if people want to use his state's geothermal assets, then they must go to them, because the state was not going to deliver them elsewhere for use. His directive seemed to mean, "Stay off, we might drive you away," or perhaps, "You may come here and use it, but only on our terms."

Studies for a geothermal energy revitalization of a community as proposed for the Susanville, California, area might point out new guideposts for the future. On the other hand, they might only be concerned with geothermal production potential and the feasibility of factories and electric utilities. Will they reveal if there is objection to growth or change, or perhaps reveal seeds for disillusionment? There will surely be social factors intimately related to geothermal development that will run concurrently with technology.

One positive conclusion may be reached through a review of current appraisals of geothermal's technology and that is the bulk of the earth's heat must be applied almost *in situ* in services other than the generation of transportable electrical power. There is too much evidence that efficient use will require recovery of low-enthalpy "deposits" with more humble and unsophisticated approaches than was originally expected. The reach of this conclusion is about to become influential.

POLITICAL POINTS

Political reaction has set in after the helter-skelter rush to acquire control of geothermal potentials under lease programs sponsored by U.S. government agencies. Elected representatives now seek to force immediate development of resource areas while administrative bodies of the same governmental agencies inhibit the development through application of regulations—and all when geothermal technology is inhibited.

The agencies of the federal government appear to have an intense interest in controlling major activities with geothermal heat. The unguided courses set by government and private interests in geothermal energy bode for future confusion or conflict and will probably never fully benefit the resolution of social difficulties. It may lead to a superdepartment, a "Department of Heat" in our government, owning every phase of geothermal heat.

CONCLUSION

Human society still seems capable (individually and collectively) of meeting transitional changes so we have only a question of learning how it can be accomplished with a minimum of trauma where geothermal potentials are involved—so that government, business and people can avoid unnecessary hardships in the area of social relationship to energy, economics, and environment while we bring the benefits of geothermal heat to the peoples of the world.

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