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UTILITY PERSPECTIVES ON
NORTHWEST ENERGY PROJECTS

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Projections of Northwest electrical power supplies during the 1980’s indicate shortfalls. The planning base for this Northwest supply encompasses all the new generating resources under construction, as well as some planned, but not started, thermal generation. Of significance to the Northwest is their large amount of hydroelectric generation which, in essence, forms the base of the whole Northwest power grid. This generation comes from federal, investor and public utility owned dams on the Columbia and Snake Rivers and their tributaries. The planning base for the 1980’s assumes low water availability from rainfall. This forecast is based on the lowest rainfall period encountered over the period of time that records have been kept. For those from the Northwest, the term “amount of snow pack” is indicative of available water and hence available energy for the ensuing year. This equates to “hitching your generator to a cloud” but it has worked well over the last 40 years and is being constantly improved through additional reservoirs and river flow management which maximizes power output. Periods of excess hydroelectric power occur during the spring runoff period when reservoir capacities have been exceeded and electrical loads have been satisfied. This situation reverses as the river flow and reservoir levels diminish in the summer. Fall of the year precipitation supports winter loads unless aggravated by several cold winters in which stream flow diminishes. Thermal plants have entered the generation picture in the last 10 years along with the advent of two coal plants, one in Oregon and one in Washington. Nuclear plants have entered with one plant in Oregon operating and five in various stages of construction in Washington. The reason for the entry of large thermal plants is that major hydroelectric sites have been used. Remaining sites are small or are locked in wilderness or closed areas. Continued effort in thermal generation must go on.

Forecasting in the Northwest is a joint effort of the utilities. Load growth estimates in the late 1980’s are in the range of one new thermal project per year. Those projects have to begin very soon. These new thermal resources are generally thought of as coal and nuclear. The existence of geothermal resources in the Northwest provides another capability which may be utilized in the planning. In order to plan for its use, it will have to be a commercially available system. The amount of electrical power provided by this resource during the 1980’s would not be large. It is, however, available energy and needs to be considered and provided if reasonably possible.

It would be assumed that the geothermal electrical energy could be accommodated whenever it was provided and in whatever quantities were available. Its mode of use would be to support the Northwest load which will allow schedule adjustments on major resources or reservoir adjustments which improve hydro generation capability. Geothermal capability in the Northwest is awaiting certain developments. In the resource assessment development area it has been assumed that the major resource found will be moderate temperature hydrothermal in the range of 300°F. So far this is an assumption because there is lack of deep well drilling to really explore what exists. So far drilling in Washington and most of Oregon and the major part of Idaho has been limited to exploratory heat rate determination. New resources must be of a temperature compatible with existing technology to provide the incentive for resource companies to do deep well drilling. This activity needs significant effort in the Northwest.

Institutional and regulatory processes differ between the states. Certain procedures and regulations pertaining to usage and development of geothermal resources do not yet exist. This is a major leg of the development process. It has to be intact before the resource can be used.

Equipment and process development capability for generating electrical power from moderate temperature resources is currently being developed. Several development programs are underway which utilize the binary system. Where is the location of the economic break point with regard to generating costs utilizing this system. It has yet to be determined.
Describing these activities in more everyday terms; there needs to be an identified, useable geothermal reservoir compatible with developed hardware, all of which can be pulled together under a useable licensing and siting process.

Each of the activities mentioned above is a major province of a different agency. The users, which may be a resource company and a utility company or a utility alone, have to have support in bringing various portions of the programs together. The states and federal government should provide some incentive toward resource assessment and later development of their lands. An initial assessment may be enough to get the developer interested. The establishment of the institutional and regulatory process is also the province of the state and federal government. Support will be required from the user. Equipment and process development stems from agencies such as the federal DOE, EPRI and the equipment companies. None of these can succeed without the success of the others but hopefully the successes will be very nearly on the same schedule.

Geothermal economics may be unfairly compared to other major thermal projects in today's world. New thermal projects, at best, can be on line in 1988, if initiated now. To which economics do you compare, 1980 dollars or do you compare 1988 dollars? Obviously, with first generation hardware and the unknowns existing, today's energy from geothermal is expensive but don't forget the learning curve and the increase efficiency derived through operating experience. Also don't forget that energy availability may be more important than economics if one considers the cost of oil generation and the impact on regional economics; it might be worthwhile to pay more for your local energy sources.

The only existing Northwest geothermal electric activity is the federal DOE's project at the Raft River Reservoir in Southern Idaho. It is the 5MWe binary system with a resource temperature slightly below 300°F. Utilizing isobutane, this system will provide an idea of generation economics for that temperature utilizing specific process equipment. Northwest utilities are participating in the project through an agreement with the DOE and the DOE engineering contractor, EG&G, at the Idaho site. The principal effort is to support EG&G during the startup and testing of the facility and then have prime responsibility for taking the project through its production testing phase to determine capability and real production economics. There are a number of project goals to be achieved but the major purpose of this endeavor is to determine whether this process equipment is economically compatible with other energy costs. In order to do this there must be a careful separation of R&D costs from those associated with normal production. The other things the utilities wish to achieve from the project are orientation and experience, both with the plant and the reservoir. No other reservoirs are in use in the Northwest.

There is ample geothermal energy in the Northwest. Its development into an electrical generating capability is based on the schedules of process equipment and resource development. There is a need for all available electrical energy. Cost of this energy for the future may very well be less important than its availability.