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J.M. Energy Consultants, Inc.

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TRANSMISSION-LINE ACCESS FOR
HYDROTHERMAL TARGET PROSPECTS
IN THE FIVE PACIFIC RIM STATES:
A LEGAL/INSTITUTIONAL ANALYSIS

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CHAPTER ONE: INTRODUCTION TO TRANSMISSION LINE ACCESS AS A
LEGAL/INSTITUTIONAL PROBLEM IMPACTING HYDROTHERMAL
GEOTHERMAL COMMERCIALIZATION

As the legion of tax, leasing and regulatory barriers facing hydrothermal geothermal commercialization finally begins to recede under the combined weight of half a decade's worth of logic, analysis and Congressional and administrative reform, D.O.E.'s legal and institutional focus must now be upon user-oriented difficulties. Chief among these "downstream" problems is the availability of adequate transmission lines to bring geothermal-based power from oft-isolated field areas to the West's large power markets. The term "adequate" in this case encompasses both technological and non-technological components.

The former feature is fairly easily related. Are there any lines within an (economically) reasonable distance of the Pacific Rim States' numerous hydrothermal "target prospects"? And what is their capacity? Can they be tapped into economically?

However, the non-technological, legal/institutional aspect of the transmission line question represents one of the thorniest energy and regulatory policy issues to surface in this country over the past half-century. It is a problem which has consistently divided analysts, courts, the electric utility industry and Congress itself into warring camps. Nearly five decades of Federal legislation, Supreme Court decision and scholarly commentary have failed thus far to satisfactorily resolve it. The

stakes are high and the conflicts intense on this issue.

The private, investor-owned electric utilities are generally larger than their publicly-owned (municipal, R.E.A. and coop) cousins. It is generally their transmission lines which are the targets of the publics' cries for access in order to "wheel" power from Federal hydro projects to their small enclaves. These municipalities, etc., are not unlike "islands" in the service area "sea" of the larger, private entity. Thus, e.g., the Cities of Riverside and Anaheim in Southern California are, despite their relatively large size (60,000 and 70,000, respectively), mere dots on the service area map of Southern California Edison (S.C.E.). Similarly, the Northern California Power Agency's (N.C.P.A.) eleven small member cities and one rural coop are easily swallowed within Pacific Gas and Electric's (P.G. &E.) broad territorial expanse. The same could also be said of the Sacramento Municipal Utility District (S.M.U.D.).

If these potentially valuable municipal customers are allowed to buy cheap Federal hydro power (to which they are granted a preference by Federal law) or, more to our point, to generate their own geothermal-based power in remote areas and then "wheel" it over private utility transmission lines to their city gates for distribution and final sale, then the larger private entities have lost a very great deal of potential revenues. Their incentives are therefore aligned in the negative on most requests for wheeling.

There is, of course, also the matter of transmission safety and reserve requirements and the exact timing of the "wheeling" to be worked out. Even more in contention is the precise charge to be paid by the entity seeking the wheeling. Should they be paying only a variable "commodity" charge, or a rate also reflecting a proportionate share of the cost of the line itself? And who shall arbitrate these predictably quarrelsome negotiations?

When the smaller entity is unable to get wheeling rights for his cheaper hydro (or geothermal) capacity, it is usually forced to buy power wholesale from the same larger utility which refused to wheel for him. From the smaller firm's standpoint, this means that he is unable to attract the big industrial users whose large demand share is such an important factor in the economics of a publicly-owned firm. More importantly from our perspective, any incentive the energy-hungry small utility might have had to adopt hydrothermal geothermal-based capacity is effectively obliterated by a foreclosure of transmission line access.

Given the fact that it is precisely these smaller systems which have shown the greatest interest in geothermal commercialization, and that they have done so in the face of serious concerns over long term reservoir performance, the reliability of hydrothermal utilization technologies and the questionable availability of market financing (and Federal loan guaranties), the potentially lethal "bottleneck" posed by legal/institutional disputes over transmission line access must be of primary concern to the

Department of Energy's geothermal commercialization managers.

The Report that follows attempts to assist D.O.E. in that task. To that end we will first sketch the legal and regulatory framework of the transmission line access problem. Next we will focus on the actual realities of hydrothermal target prospect/transmission line overlap and coincidence in the five Pacific Rim states, including any pending lines or planned facilities not yet under construction. Finally, each target prospect's transmission line access situation will be profiled with emphasis upon the institutional players involved and their historical, present and possible future conduct in this crucial arena. Generic/site specific proposals for D.O.E. action and/or statutory/regulatory initiative or reform will also be included.

CHAPTER TWO: A LEGAL AND REGULATORY OVERVIEW

Legal and institutional conflicts surrounding transmission line access have raged across the American political and legal scenes for the past 45 years. Beginning with the electric utility scandals/mammoth Federal Trade Commission investigation of the late 1920's/early 1930's; continuing through Congressional passage of the Public Utility Holding Company Act and Federal Power Act in 1935; and culminating with the Public Utility Regulation Policy Act of 1978, there has been a persistent hue and cry raised over this hotly-contested question. To fully understand the import of the legal issues involved, we must look at §202 (b) of the Federal Power Act of 1935 and its successors or would-be successors.

(A) The Federal Law Framework: §202 (b) Of The Federal Power Act:

The draft bill that became the Federal Power Act of 1935 originally included a section which would have imposed a "common carrier" status upon interstate electric transmission lines.^{1/} The language in question would have made it "the duty of every public utility to . . . transmit energy for any person upon reasonable request . . .".^{2/} This provision was substantially weakened in Conference Committee and the eventually enacted statute read as follows:

"Whenever the Commission, . . . finds such action

necessary or appropriate in the public interest it may by order direct a public utility (if the Commission finds that no undue burden will be placed upon such public utility thereby) to establish physical connection of its transmission facilities with the facilities of one or more persons engaged in the transmission or sale of electric energy, to sell energy or to exchange energy with such persons: Provided, that the Commission shall have no authority to compel the enlargement of generating facilities for such purposes, nor to compel such public utility to sell or exchange energy when to do so would impair its ability to render adequate service to its customers."^{3/}

(emphasis added)

This convoluted statutory language represented a fairly substantial step backward from the "common carrier" policy stance envisioned in the original draft. The interconnection authority is carefully hedged and the concept of "wheeling" is not even explicitly dealt with. Indeed, the now defunct Federal Power Commission^{4/} consistently interpreted this provision as applicable to "interconnection" of facilities only and deemed it inadequate to support any exercise by it of compulsory "wheeling" authority.^{5/}

Though often challenged by scholars and publicly-owned

electric utilities on this point,^{6/} the F.P.C. was upheld by the courts in their interpretation of §202(b). In the leading case, Otter Tail Power Company v. U.S.,^{7/} the U.S. Supreme Court held that: "These [common carrier] provisions were eliminated [from the eventual statute] to preserve 'the voluntary action of the utilities' [cite to Senate Conference Report]. It is clear, then, that Congress rejected a pervasive regulatory scheme for controlling the interstate distribution of power in favor of voluntary commercial relationships."^{8/}

Faced with this judicially-approved regulatory abstention, the smaller utilities turned to the third branch of government and mounted wave after wave of political assault in the form of Congressional bills amending §202 (b) to insert common carrier language^{9/} on wheeling. None of these efforts had been successful, however, prior to 1978. Perhaps the majorities of both houses of Congress during the ensuing 40 years still agreed with the 1935 Conferees to the effect "that enlightened self-interest will lead the utilities to cooperate with the Commission and each other . . .".^{10/}

President Carter then included a common carrier provision in his proposed National Energy Act in 1977,^{11/} but by that time the pro-wheeling forces had changed their emphasis.

(B) Nuclear Power Plant Review: An Antitrust Weapon:

Their first success came, paradoxically, in the legisla-

tive arena. As enacted by Congress, the 1970 amendments^{12/} to the Atomic Energy Act^{13/} contained a section requiring the former Atomic Energy Commission (A.E.C.) (now the Nuclear Regulatory Commission (N.R.C.)) to refer all utility applications for nuclear power plant licenses to the Antitrust Division of the Justice Department for an "antitrust review."^{14/} The Assistant Attorney General in charge of that Division must make a report to the N.R.C. on the anti-competitive impacts of issuing the proposed license.^{15/} The Commission then must make a finding as to "whether the activities under the license would create or maintain a situation inconsistent with the antitrust laws . . ."^{16/} and, if its findings are "affirmative . . . [it] shall have the authority . . . to issue a license with such conditions as it deems appropriate."^{17/} This joint N.R.C./Justice Department procedure is an administrative substitute for the anti-trust laws, which do not otherwise apply to nuclear plant licensing.^{18/}

Under the possible stricture of not receiving a license for their expensive nuclear power plants, large utilities have proved very amenable to accepting those "conditions" proposed by the Antitrust Division. More often than not, these involve agreements to wheel power over the lines built to carry the nuclear-based output. As of July 30, 1975, no less than 15 of the 24 approved nuclear applications in-

cluded requirements for some sort of transmission service.^{19/}
Though this appears to be an admirable record, some pro-public entity scholars have complained that their clients exclusion from the private utility/Antitrust Division negotiations leads to the creation of large loopholes in the N.R.C.'s "conditions".^{20/} In any event, the recent and ongoing slowdown in the nuclear power movement will mean a sharp curtailment in the number of opportunities for forcing transmission line access arrangements upon the larger utilities in this forum.

(C) The Antitrust Laws: Otter Tail's Legacy:

The main avenue of small utility redress had become the courts by the mid-70's. The main reason for this was the fact that the same case which upheld the F.P.C.'s refusal to assert jurisdiction over wheeling has, paradoxically, actually had a major positive effect upon attempts at securing transmission line access across the country. For Otter Tail Power v. U.S.^{21/} had also held that:

"There is no basis for concluding that the limited authority of the Federal Power Commission to order interconnection was intended to be a substitute for, or to immunize . . . [electric utilities] from, anti-trust regulation for refusing to deal with municipal corporations."^{22/}

This 1973 U.S. Supreme Court decision, by subjecting transmission line access to the antitrust scrutiny of the courts for the first time, dramatically "increased the leverage of small utilities in dealing with vertically integrated competitors."^{23/} Unfortunately, however, an antitrust solution is, by necessity, one involving potential for fear-some time delays. Unlike the case of an N.R.C. licensing situation, the larger electrical entity has no incentive to quickly acquiesce to requests for wheeling. There is also no regulatory watchdog around to keep them in line with respect to the terms and conditions of such arrangements. Thus, although the situation had improved somewhat, flat refusals to deal may have been replaced by protracted foot dragging and the insertion of onerous charges and other requirements in wheeling contracts.

(D) State Law: A Different Approach:

That it was not impossible to fashion a legislative solution prior to 1978^{24/} was proven by the actions of the State of California. In 1976, the state legislature enacted a statute^{25/} requiring that intrastate transmission line access be granted to all producers of power from alternate (non fossil and nuclear) energy sources upon the order of the California Public Utilities Commission (C.P.U.C.)^{26/}. The C.P.U.C. is to set the terms of "reasonable compensation" for such service,^{27/} as well as "such reasonable terms, condi-

tions, and requirements as it deems appropriate."^{28/} Originally enacted at the request of Dow Chemical and other large industrial users and entitled "Private Energy Producers" the statute was amended in 1978 (upon the suggestion of the author and others on the State Geothermal Task Force) to more clearly apply to municipal and other public bodies.^{29/} We shall discuss its impact upon hydrothermal geothermal commercialization in California in more detail in Chapter Three.

(E) The Public Utility Regulatory Policies Act of 1978:
Half A Loaf?

With an ever-sharpening salient from the antitrust angle and with the spectre of the State of California finally taking fairly forceful action to prevent the squeezing of large industrial users and (upon the urging of the State Geothermal Task Force) municipal electric systems by large private utilities, as well as a firm proposal from the President, the U.S. Congress finally faced up to what by then had become a half-century's worth of problems.

In its 1978 enactment of the "Public Utility Regulatory Policies Act",^{30/} Congress began benignly enough by directing F.E.R.C., e.g., to make a "study" of the problems confronting better coordination and "pooling" of utility system resources.^{31/} But the "action" designated to follow up on that analysis was to be a F.E.R.C. "recommendation" that the involved elec-

tric utilities enter "voluntarily into negotiations".^{32/}

It all sounded hauntingly familiar to those who have followed the problem since 1935. Fortunately, however, Congress went a good deal further.

With regard to small and large industrial users (those utilizing cogeneration) and to "small power producers" (using "renewable resources", and of less than 80 megawatts in size)^{33/}, Congress also empowered F.E.R.C., without study but after voluminous "consultations", to make certain rules requiring the interconnection of such facilities and the purchase of their excess power.^{34/} But this grant of administrative authority was very narrowly circumscribed by requirements that no such F.E.R.C. order "result in a reasonably ascertainable uncompensated economic loss" to, "place an undue burden on" or "unreasonably impair the reliability of" any electric utility required to supply those services.^{35/}

P.U.R.P.A. will probably best be remembered, however, as the act in which Congress decided, finally, to give F.E.R.C. wheeling authority. Such an order can be requested only by an "electric utility or Federal power marketing agency",^{36/} however, not by an industrial cogenerator or "small power producer". For those two categories, interconnection might not be enough without wheeling.

For geothermal, faced with developer aggressiveness (Magma and Republic) in the power plant area but electric

utility cautiousness, it was "half a loaf" but better than none.

There was some hope for these "developer power producers" in another key area. F.E.R.C. was ordered to report within one year on possible exemptions of such facilities (but only of less than 30 megawatts size this time) from both Federal and State electric regulatory laws and regulations.^{37/} That report and the rules to implement it have recently been issued.^{38/} and their contents are encouraging.

In addition, the recent efforts of the geothermal industry and D.O.E. to up the cut off point of "30 megawatts" for the possible regulatory exemption rules to a more realistic (for geothermal) 80 megawatts and to more explicitly include "geothermal resources" within the term "renewable resources" within "small power producer" have finally borne fruit. As passed by Congress after a lengthy conference, the "Synthetic Fuels Bill of 1980" (S.932) contains those provisions.^{39/}

FOOTNOTES

CHAPTER TWO

- 1/ See S. Rep. No. 621, 74th Congress, 1st Sess.; H.R. Rep. No. 1318, 74th Cong., 1st Sess. (H.R. 5243, S. 1725).
- 2/ id., quoting §202 of H.R. 5423.
- 3/ Act of Aug. 26, 1935, c. 687, Title II, §213, 49 Stat. 848, now codified at 16 U.S.C. §824a (b).
- 4/ The F.P.C.'s duties were transferred to the newly-created Federal Energy Regulatory Commission (F.E.R.C.) in 1977 with the creation of the Department of Energy (see 42 U.S.C. §7171, P.L. 95-91, Title IV, §401, 91 Stat. 582).
- 5/ See, e.g., City of Paris, Kentucky v. Kentucky Utilities Co. (1969, F.P.C.) 80 P.U.R. 3d 331.
- 6/ See, e.g., "Solving Your Power Supply Problems With The Antitrust Laws", address by Wallace E. Brand, Esq. to the A.P.P.A., May 21, 1975.
- 7/ 410 U.S. 366 (1973).
- 8/ 410 U.S. 366, at p. 374.
- 9/ See, e.g.: S. 350/H.R. 2101, 88th Cong., 1st Sess.; S. 1472/H.R. 2072, 89th Cong., 1st Sess.; S. 1071/H.R. 12585, 91st Cong., 1st Sess.
- 10/ S. Rep. 621, 74th Cong., 1st Sess., at p. 49.
- 11/ S. 1469, 95th Cong., 1st Sess. (1977), at §521(a).
- 12/ P.L. 91-560, 84 Stat. 1472.

- 13/ 42 U.S.C. §§2011-2282.
- 14/ 42 U.S.C. §2135(c) (1).
- 15/ id.
- 16/ 42 U.S.C. §2135(c) (5).
- 17/ 42 U.S.C. §2135(c) (6).
- 18/ Statesville v. A.E.C., 441 F. 2d 962 (1969).
- 19/ D. Penn, J. Delaney and T. Honeycutt, "N.R.C. Antitrust Review of Nuclear Power Plants: The Conditioning of Licenses" (1976), unpublished N.R.C. report, at pp. 16-39.
- 20/ Matthew Cohen, "Competition In The Electric Industry: Beyond The Antitrust Laws", (1978) unpublished student paper, Yale University Law School, at pp. 35-37.
- 21/ op. cit, fn.
- 22/ 410 U.S. 366, at 374-375.
- 23/ Cohen, op. cit., at p. 34.
- 24/ A theory held by Prof. Christopher D. Stone (U.S.C. Law Center), inter alia..
- 25/ Stats. 1976, Ch. 915, §1 (Warren).
- 26/ Cal. Pub. Util. Code §§2801-2816, as amended.
- 27/ Cal. Pub. Util. Code §2814.

28/

Cal. Pub. Util. Code §2812.5.

29/

See Stats. 1978, Ch. 1271, §17, amending Cal. Pub. Util. Code §2802.

30/

P.L. 95-617, 92 Stat 3117, 15 U.S.C. 791(a), 824(a), 824(b), 824 (i), 824(j), 824(v), 16 U.S.C. 2601 et. seq..

31/

P.L. 95-617, Title II, §205, 92 Stat. 3140, 16 U.S.C. §824(a)-1 (b).

32/

id. (emphasis added).

33/

16 U.S.C. §796 (17), P.L. 95-617, Title II, §201, 92 Stat. 3134.

34/

16 U.S.C. §824(a), P.L. 95-617, Title II, §210, 92 Stat

35/

16 U.S.C. §824(i), P.L. 95-617, Title II, §210, 92 Stat. 3135.

36/

16 U.S.C. §824(j), P.L. 95-617, Title II, §211, 92 Stat. 3136.

37/

16 U.S.C. §824(a)-3 (e), P.L. 95-617, Title II, §210, 92 Stat. 3144.

38/

See 45 Fed. Reg. 12214 (Feb. 25, 1980), 45 Fed. Reg. 17959 and 44 Fed Reg. 65744.

CHAPTER THREE: THE INSTITUTIONAL CONSTRAINTS

INTRODUCTION:

Although the bulk of the Nation's electric transmission lines are now interconnected^{1/} to form a fairly complete interstate "grid", or electricity distribution network,^{2/} we have already seen that, unlike many other areas of the law, the Federal government has not yet chosen to exercise its Constitutional hegemony over all power transmission. Thus the State of California was able to enact its own "wheeling" legislation covering intrastate transmission in the vacuum left by this partial Federal abstention.

Even the "Public Utility Regulatory Policies Act of 1978"^{3/} did not, as had originally been proposed by President Carter,^{4/} impose certain electric utility regulatory policies upon the states. Rather, it directed each state utility regulatory body to "consider each standard established by . . . [the Act] and make a determination concerning whether or not it is appropriate to implement such standard Nothing in this subsection prohibits any State regulatory authority . . . from making any determination that it is not appropriate to implement any such standard, pursuant to its authority under otherwise applicable State law."^{5/} P.U.R.P.A. then goes on to specifically empower said state entities to "decline to implement any such standard."^{6/}

In terms of practical as opposed to legal realities, the transmission line access question in the Pacific Rim States actually takes on a non-regulated hue. It is, in fact, dominated

by two monstrous players — the Federal Bonneville Power Authority (B.P.A.) in Washington and Oregon and a privately-owned triumvirate — the California Power Pool — to the south. We shall now turn our attention to an examination of the legal and in particular institutional attributes of both B.P.A. and the C.P.P., as well as their satellite transmission systems, with an eye towards the setting that they, as institutions, will present to commercialization of this region's numerous hydrothermal geothermal target prospects.

(A) Bonneville Power Authority - Northwest Giant:

In a 1978 Report to D.G.E.'s since-defunct Pacific Region Team,^{7/} we noted that the Bonneville Power Authority (B.P.A.) was not created as a regional maker and shaker, like the Tennessee Valley Authority (T.V.A.) in the Southeastern U.S.. What B.P.A. did get was the authority to build transmission lines and distribute the regions then-abundant hydroelectric power.^{8/} Once the B.P.A. had spread its transmission line fingers into every nook of the Northwest, this sparsely populated area was faced with a surfeit of cheap power. A World War II government decision to build no less than five large energy-intensive aluminum plants^{9/} along the Columbia River was premised on that availability. The post-war economic boom in the Pacific Northwest was another inevitable result, as those same aluminum plants, now sold into private hands, accounted for one-third

of the Nation's capacity and gobbled up a corresponding portion of B.P.A.'s total output.

The structure of B.P.A.'s enabling legislation also forced the Northwest's electric utility industry into a far different mold than that evolving in California and one much more amenable to "wheeling". Congressional-passed provisions requiring B.P.A. to give a "preference" to publicly-owned entities. The stated rationale was to "preserve the preferential status of public bodies and cooperatives"^{10/} by giving them a "priority" both at the time of initial allocation of power^{11/} and when contracting for sale and ultimate transmission.^{12/} Prior to January 1, 1942, fully half of the power had to be sold to "public bodies and cooperatives"^{13/} and industrial customers were even barred from re-selling B.P.A. transmitted power to privately-owned utilities.^{14/}

In response to these publicly-owned utility preferences, the State of Washington's voters set up numerous "Public Utility Districts" (P.U.D.s) to complement Seattle's existing publicly-owned system.^{15/} Over 80% of that state's power is still delivered by publicly-owned bodies. Unsurprisingly, Washington's powerful Congressional delegation has proved to be a bulwark of support for the "preference" system.

In Oregon, by contrast, the early history had been one of private power (Portland General Electric, Pacific Power &

Light, etc.) and the P.U.D. voter referendums were actively opposed and generally defeated. Only 20% of Oregon's power is delivered by non-private electric utilities. The recent unsuccessful moves to amend the B.P.A.'s Act and "rearrange the "preferences" were spearheaded by Oregon,^{16/} where the private utilities, shut out of any B.P.A. power since 1973 due to rising demand by "preference customers", constructed a scenario of new, massive nuclear and coal-fired plants which was slowly beaten to death by public power, consumer and environmentalist opposition.

For purposes of hydrothermal geothermal commercialization, then, the key features of the Pacific Northwest's electric utility sector are two:

- (1) The domination of public bodies, including B.P.A., which controls the bulk of the transmission lines, and the numerous local public utilities (P.U.D.s in Washington and R.E.A.s or municipals (Eugene Water & Electric Board (E.W.E.B.)) in Oregon. The transmission line access problem has never really surfaced to any great degree here in the Pacific Northwest. This is a publicly-owned network for the most part. There are four fairly sizeable private utilities (Portland G.E., P.P. & L., Puget Sound P. & L. and Washington Water Power Supply Co.) but the publics dominate the transmission lines.

- (2) The over-consumption of electricity (twice the per capita usage rate of the rest of the country) in the region has led to early exhaustion of available hydro capacity. Coupled with successful opposition to coal and nuclear plants, this has created a large commercialization target for hydrothermal in the Region.

Thus the successful commercialization of any hydrothermal geothermal prospect in or near the Pacific Northwest will confront eager customers and no large legal or institutional problems in wheeling that power to those prospective users over largely public lines. In the Pacific Northwest B.P.A. ^{17/} controls fully 80% of the region's transmission lines.

If there is a user-side barrier in this area it is more technological or economic in nature. This could be resolved by the construction of small (10 MWe) "icebreaker" plants to demonstrate both reservoir performance and non-flash utilization technology.

Also, as we have noted in our ongoing series of Federal land management "Tracking Reports", Federal land access to the resources themselves continues to be a major hurdle, to transmission line construction even more than to leasing, field development and power plant siting due to the length of the lines from remote field areas and the number of Federal parcels they must cross.

(B) The California Power Pool -- A Grid Of A Different Political Color:

As Bierman, Stover, Nelson and Lamont stated three years ago in their report on the antitrust aspects of geothermal development:

"The sheer magnitude of electric consumption in California and the location of major geothermal resources within its borders make the rate at which development of this resource progresses there critical to its overall employment [and commercialization]^{18/}. And the key limiting factor in that developmental rate (after Federal land access) will be transmission line access.

(1) The Private Giants: California Power Pool (C.P.P.):

California's electric utility picture is dominated by two of the Nation's largest, privately-owned electric entities -- Southern California Edison (S.C.E.) in the south and Pacific Gas and Electric (P.G. & E.) in the north. Between them, they control 71.9% of the state's "net dependable generating capacity"^{19/}. P.G. and E.'s 17,000 miles of transmission lines, coupled with S.C.E.'s roughly 10,000 line miles, also make them by far the major factors in terms of transmission line access. Combined with the third private utility, the smaller San Diego Gas and Electric (S.D.G. & E.) in the Califor-

nia Power Pool, they control 60% of the lines. They are not the only major electric utility players in California, however, and the variegated nature of the industry, coupled with the relatively more encouraging legal framework, gives cause for optimism.

(2) The Public Players:

(a) D.W.P.:

The publicly-owned electric utility sector in particular makes its presence felt in California. Foremost among its components is the City of Los Angeles' Department of Water and Power (D.W.P.), with nearly 13% of the state's net capacity and a fairly extensive transmission network of its own, extending from both southern Nevada/northern Arizona's coal-fired plants and the Owens Valley (south of Mono-Long Valley) southwesternly past Coso and Randsburg to the Los Angeles city limits.

(b) D.W.R.:

The State of California's Department of Water Resources (D.W.R.), already active in geothermal as a Federal lessee,^{20/} coventurer in field exploration^{21/} and power plant operator,^{22/} presently generates over 1,000 megawatts of hydropower. But this is inadequate to cover D.W.R.'s water pumping-related power needs, and its wholesale contracts with P.G. and E. and others will eventually be supplanted by geothermal. D.W.R. does not

have extensive transmission lines, however, and must wheel most of its power over P.G. and E. and Bureau of Reclamation lines.

(c) C.V.P.:

The U.S. Bureau of Reclamation's Central Valley Project (C.V.P.) generates roughly 1200 megawatts of hydroelectric capacity and has some rather extensive transmission lines. These are integrated operationally with those of P.G. and E., however, and this has led to some severe problems in the past, as we discuss below.

(d) S.M.U.D.:

The Sacramento Municipal Utility District (S.M.U.D.) is actually a split, private/public municipal corporation operating in Sacramento and Placer Counties as an "island" in the P.G. & E. "sea". Its Rancho Seco nuclear facility (net 913 MW) and six hydro units (649 MW) are supplemented by both C.V.P. and P.G. and E. power. All of S.M.U.D.'s operations are interconnected and coordinated with P.G. and E., as one might expect given its isolation. S.M.U.D. has recently entered the geothermal arena, possibly as a result of controversy over the second unit at Rancho Seco. It has committed to build at least one plant at The Geysers already and was also a successful bidder at the State Lands Commission's recent Geysers sale.

(e) N.C.P.A.:

The most notable California-based public electric entity over the past decade has been the "joint powers" effort called Northern California Power Agency (N.C.P.A.), consisting of eleven municipalities (Alameda, Biggs, Gridley, Healdsburg, Lodi, Lampoc, Palo Alto, Redding, Roseville, Santa Clara and Ukiah) and the Plumas-Sierra R.E.A.. All are and have been wholesale customers of either C.V.P. and P.G. and E., with their power delivered almost totally over the latter's lines. The total peak demand of these dozen entities is less than 600 MW.^{23/} For over a decade N.C.P.A. has fought for transmission line access to The Geysers. As will be discussed in more detail below, an Antitrust Division (Justice Dept.) investigation and consent decree with P.G. and E. finally opened that door several years ago. As a result, N.C.P.A. is about to begin construction of the 110 megawatt "N.C.P.A. Geothermal Unit No. 2" on Shell Oil's Federal leases at The Geysers in Sonoma County, and has also begun the siting approval process for "N.C.P.A. Geothermal Unit No. 1", a 66 MWe plant in Lake County on private land. No clearer example of the crucial "bottle-neck" role played by transmission lines could be found than in the history of N.C.P.A.'s efforts at The Geysers.

(f) "So. Cal. Cities": Anaheim, Riverside, et. al.:

Although they have not yet formed a "joint powers agency" to develop geothermal resources for their own generation, five Southern California cities (Anaheim, Riverside, Azusa, Colton and Banning) and one coop (Anza) represent a totally analogous situation to that of N.C.P.A. in the north. With approximately 600 Megawatts of peak demand^{24/} (mostly in Anaheim (Orange Co.) and Riverside) and in proximity to several prime geothermal commercialization prospects in the Imperial Valley, they are surrounded by Southern California Edison's service area and have neither generating capacity nor transmission lines of their own. Their past experiences with gaining transmission line access from S.C.E. are also in close parallel to those of their dozen Northern California counterparts' struggle with P.G. and E.. Their potential as geothermal users and their history of line access problems are discussed below.

(g) "Little Three": Glendale, Burbank and Pasadena:

In addition to the six, non-aligned publics and the mammoth D.W.P., southern California also presents three cities who generate much of their own power — the cities of Glendale, Burbank and Pasadena. With nearly 800 megawatts of peak demand among them and increasing air quality problems with their largely oil-fired, L.A.

air basin-sited plants, the "Little Three" represent yet another attractive commercialization target for geothermal. Thus far only Burbank has been an aggressive entrant, however, with both developer joint ventures,^{25/} Federal leases,^{26/} and plans for a coal-geothermal hybrid power plant.^{27/}

(h) Irrigation Districts:

Finally, two "irrigation districts" — Turlock-Modesto in Central California's San Joaquin Valley and Imperial in the county of the same name — present yet another potential user target for geothermal commercialization in California. Their peak demands (roughly 375 megawatts for the Imperial I.D. and about half that much for Turlock-Modesto) also fit nicely into the scale of geothermal utilization. The Imperial I.D. has already shown a high level of interest, with contracts to buy the output of several developer-built plants at East Mesa (Magma and Republic).

Nor are governmental users the only attractive California targets for commercialization.

(3) The Industrial Players: Where Big Is Small:

Generally speaking, electricity is not a large cost element for the majority of U.S. manufacturers. Yet those for which it exceeds three (3) per cent of sales account for fully half of the total electricity usage by industry.^{28/} In

six basic industries in particular — primary metals, paper, chemicals, oil refining, food processing and a group we shall dub "rocks" (stone (including cement), clay and glass) — the cost of electricity is significant.

Not surprisingly, individual firms in these industries have been the industrial "trailblazers" in seeking out the dependability and cost savings offered by the geothermal alternative. The list includes: Crown Zellerbach and Weyerhaeuser (paper); Ore-Ida Foods (food processing); Dow Chemical Co. (chemicals and glass); and Amax, Inc., Anaconda Co. and Kaiser Aluminum (primary metals). The reasons for their interest are not hard to discern.

Though "large" users of electricity via wholesale purchase from a utility, each of these industrial giants could probably satisfy its plant-specific "total energy" needs (space heating and cooling, process heat and electricity) with a cogeneration or "cascading use" type of geothermal project on a relatively small (10 MWe and a similar amount thermal) basis. Were the resource in question larger than their immediate needs, it would provide the basis for economical, risk-reduced plant expansion. Since many if not all of these industrial users are served on an "interruptible" (non-"firm", or non-guaranteed) basis by electric utilities, their vulnerability to disruption has increased exponentially over the past decade as large coal and nuclear plants are

sidetracked and government limitations on oil or gas-fired boilers have been instituted.^{29/} In such a business planning setting, the geothermal alternative is sure to receive even more serious attention than that previously accorded to it. The attractive tax breaks recently accorded to geothermal (particularly the large investment tax credit)^{30/} should also be of value. In addition, the P.U.R.P.A. provisions noted above, encouraging cogeneration and "small power producers" of alternate fuels, would be of great assistance to industrial users if implemented by F.E.R.C..

In California, of course, the 1976 Public Utilities Code amendments^{31/} authorizing the P.U.C. to require wheeling and interconnection are available notwithstanding any regulatory reticence at the Federal level. This last point is important, since the industrial user market for geothermal is large in California. Industries formerly dependent upon now-scarce natural gas must now turn to other sources. For all practical purposes this means either solar or geothermal and the former source has yet to make inroads outside of the residential sector. Geothermal's main drawback, aside from public and user ignorance, is its site-specific characteristic. But neither of these barriers appears insurmountable.

A recent study^{32/} done for the California Energy Commission's Geothermal Office states that the industrial direct use market "target" alone (no electricity) already totals 56 trillion

BTUs^{33/} (.056 quads) and could rise to 90 trillion BTUs by the year 2,000.^{34/} The great bulk of this "target" (46.5 trillion BTUs or roughly 84%) is now served by natural gas.^{35/} The target is very conservative, in fact, since total industrial and commercial use in 1975 totaled over 2,000 trillion BTUs.^{36/} Four California industries appear to present outstanding opportunities — food, paper, lumber and chemicals,^{37/} and they provide the bulk of the 56 trillion BTU target.

(4) Transmission Line Access In Northern California

Other studies have chronicled in detail the decade-long struggle of the twelve-member N.C.P.A. to gain transmission-line access from The Geysers.^{38/} We shall only touch on certain aspects of that episode as symptomatic of the access problems faced in the past by potential geothermal users — both municipal and industrial — in northern California. There the dominant transmission line owner is P.G. and E.. Through the use of its own extensive (17,000 mile) transmission network, as well as some interesting contractual provisions with the U.S. Bureau of Reclamation's Central Valley Project (C.V.P.), P.G. and E. will exercise a dominating influence over any efforts by other users to develop geothermal resources at The Geysers or any of the other K.G.R.A.s in northern California. Though that influence has in the past been largely negative, the recent legal developments

discussed in Chapter Two seem to have created a more "receptive" climate for the wheeling of geothermal-based power by P.G. and E..

(a) The Pacific Intertie, C.V.P. and The Role of The California Power Pool:

The California Power Pool (C.P.P.), as noted earlier consists of P.G. and E., S.C.E., and S.D.G. & E.. In addition to controlling roughly 60% of the state's high voltage transmission lines (230 kv or higher), this private utility trio also dominates the crucial "Pacific Intertie", which brings Canadian and B.P.A. hydro power to the West's major load centers in California.

The Pacific Intertie consists of two 500 kv A.C. (alternating current) lines and one 750 kv d.c. (direct current) line, the latter running through Nevada to southern California. Capacity of the former is equal to 2,000 megawatts and that of the d.c. line is rated at 1,350 megawatts. D.W.P. owns half of the d.c. line but the remainder of this large and vital transmission system is controlled by the California Power Pool.^{39/}

Under the terms of the "Pacific Intertie Agreement",^{40/} the C.P.P. agreed, collectively, to coordinate with B.P.A. on the transfer of its hydro power to the south; to transit so-called "Canadian Entitlement Power"^{41/} to those entities in California (such as D.W.R.) receiving

same; and to exchange its own output for C.V.P. hydro capacity.^{42/} Individually, P.G. and E. agreed to interconnect S.M.U.D., D.W.R. and C.V.P. so as to enable them to get Canadian Entitlement and B.P.A. power, while S.C.E. was to do likewise for D.W.P. and the Metropolitan Water District (M.W.D.), a private water utility serving southern California.

The C.P.P.'s control over the Pacific Intertie, coupled with its other, extensive transmission lines, places it in a preeminent position in California. It is analogous to that of B.P.A. in the Pacific Northwest, but coming, of course, from a totally different psychological and business perspective. Although S.D.G. & E. holds 7% of the C.P.P., the real lynchpins are P.G. & E., (50%) and S.C.E. (47%).^{43/} In northern California P.G. and E. is, by its own terms and through its role in the C.P.P., the factor to be reckoned with. A key element in that hegemony lies in its contractual arrangements with the U.S. Bureau of Reclamation's C.V.P..

The C.V.P. began operations in 1944 to conserve scarce water supplies in California's San Joaquin Valley. Needing transmission lines to market its concomitantly-generated hydro power to public bodies like the City of Santa Clara, the C.V.P. eventually entered into two separate agreements with P.G. and E. in 1951.^{44/} One pro-

vided for transmission,^{45/} the other for interchanges and sites.^{46/} Sheldon Bierman and his colleagues have stated that:

"While providing C.V.P. with needed coordination, the two contracts were so phrased as to create a situation in which P.G. and E. would be able to preserve and extend its great market power while the other, small utilities in northern California would remain dependent upon it."^{47/}

C.V.P. sales of power, wheeled by P.G. and E., were effectively confined to the Central Valley and Bay Areas of northern California, even though other utilities were willing to purchase and/or wheel such power outside of P.G. and E.'s service area.^{48/}

When the Pacific Intertie was completed in the mid-60's, C.V.P. and P.G. and E. entered into a separate contract regarding wheeling of B.P.A. power to C.V.P..^{49/} Article 24 (a) of that agreement provided that P.G. and E. would wheel C.V.P. power only to customers who were not also P.G. and E. wholesale customers and who had also been C.V.P. customers since ^{50/}1951.

More crucial from our perspective was Article 19(g) of that 1967 agreement. It precludes C.V.P. from wheeling power from developers of new capacity or energy

sources (such as geothermal) within P.G. and E.'s service area without the latter's consent.^{51/} It was precisely this clause which P.G. and E. invoked to block any N.C.P.A. geothermal development at The Geysers from being wheeled over C.V.P. lines to the N.C.P.A. — member utilities.

(b) S.M.U.D. and The California Power Pool:

Being surrounded by P.G. and E., S.M.U.D. too has had to enter into agreements which have delayed and circumscribed its ability to begin adopting geothermal resources as a power source. S.M.U.D., under a 1970 agreement with P.G. and E., must sell any unused geothermal power to P.G. and E. at what amounts to a price below its own cost.^{52/} Only the deferral of its second nuclear unit (at Rancho Seco) and rising costs elsewhere have now led it to enter the geothermal arena. The 1975 amendments to its contract with P.G. and E. restricted it from adding capacity unless its potential deficiency rose above two million kwhs annually.^{53/} Only Rancho Seco II's demise could have created such an occurrence.

(c) The Present Atmosphere:

The post-Otter Tail atmosphere, an aggressive Anti-trust Division investigation of P.G. and E. in the mid-1970's and the 1976 and 1978 California and Federal legislation have combined to lighten the latter's atti-

tude towards its smaller competitors. N.C.P.A. was suddenly able to secure wheeling over P.G. and E. lines for its proposed Geysers plants, as were D.W.R. and S.M.U.D.. But only time will tell if the access problem in northern California has been solved. The past may not be repeated, but its shadows may partially block the rapid growth geothermal needs.

(5) Transmission Line Access In Southern California:

The cities of Anaheim, Riverside, Colton, Vernon, and Azusa built their own municipal electric systems before 1900. After the turn of the century Pasadena, Glendale, Burbank and the City of Los Angeles itself did likewise. The latter four, however, had access to cheap hydro power, thus establishing their own capacity. L.A.'s D.W.P., in effect, colonized the Owens Valley (between Coso and Mono) early on and used its water for hydro generation. The other three bought hydro directly from the Federal Hoover Dam from the 1930's on. Thus these larger entities remained independent. But the first named cities, and the tiny Anza Coop did not fare as well.

When S.C.E. consolidated its hold on Southern California in 1909 by purchasing no less than thirteen (13) small, private utilities, it also tried to buy up these specific municipal systems, but to no avail.^{54/} Since then S.C.E. "has followed a course of refusing to coordinate with [the] small

systems . . . , requiring long-term, all-requirements contracts and refusing to wheel power from other bulk power suppliers",^{55/} according to Bierman.

The U.S. Department of Justice's intervened in S.C.E.'s San Onofre Nuclear Plant Units II & III A.E.C. licensing proceeding in order to try to ease this situation.^{56/} Edison has repeatedly blocked attempts to wheel Federal power to these small "captive" cities,^{57/} who are excellent prospects for geothermal usage and in close proximity to both the Imperial Valley and S.C.E. lines running into Southern California from the Colorado River just north of the Valley.

Intervention in the San Onofre Units II and III proceedings and the Palo Verde (Arizona) licensing proceeding by the Antitrust Division seem to have softened S.C.E.'s position on both wheeling and on allowing the municipals to participate in large coal and nuclear projects however. The how-defunct Sundesert Nuclear Plant, e.g., had most of them represented.

S.C.E. is also embarking on some geothermal plant building of its own in the Imperial Valley,^{58/} and the ultimate necessity of building a joint line from there to its existing corridors just to the north may have already occurred to it.

In any event, the wheeling situation in Southern California is not all that much different institutionally than in

the north. With the 1976 state law, P.U.R.P.A. and Otter Tail overhanging the picture, however, it has certainly improved in the past half-decade. The latter has just been relied upon by the 10th Circuit Court of Appeals to throw out a District Court's refusal to invoke antitrust laws in a case involving a flat denial of wheeling by a large utility to a coop,^{59/} so the law in this area appears to be settling.

We shall now look at each "target prospect" to see just which entities control the available lines and ascertain precisely where new lines are needed. This information will, in turn, be related to our institutional and legal analyses in order to pinpoint potential problem areas and possible solutions.

FOOTNOTES

CHAPTER THREE

- 1/ Texas is the lone exception.
- 2/ Rep. Ottinger (D. N.Y.) and others (including the late Sen. Lee Metcalf (D. Mont.) have in the past introduced legislation requiring the full interconnection of all the Nation's systems into such a "grid". See
- 3/ P.L. 95-617, 92 Stat. 3117, 46 U.S.C. §2601 et. seq.: op. cit.
- 4/ National Energy Plan,
- 5/ 16 U.S.C. §2621(a) (emphasis added).
- 6/ 16 U.S.C. §2621(c).
- 7/ See The Legal and Institutional Problems Facing Geothermal Development In Oregon And Washington (Oct. 1, 1978), J.M. Energy Consultants, Inc. Rpt. No. 1004 (D.O.E. Contract No. ET-78-C-03-2121), hereinafter cited as "J.M. Report".
- 8/ *ibid.*, at pp. 3-18.
- 9/ Each ton of aluminum representing 55,000 kwhs of electricity (*ibid.*, at p. 5).
- 10/ 16 U.S.C. §832(d).
- 11/ 16 U.S.C. §832(c) (b).
- 12/ 16 U.S.C. §832(d) (a).
- 13/ 16 U.S.C. §832(c) (b).

14/ 16 U.S.C. §832(d) (a).

15/ Seattle City Light was founded in 1913.

16/ See J.M. Report, op. cit., at pp. 8-14.

17/ Innovation vs. Monopoly: Geothermal Energy In The West, Bierman et. al. (July 1977) at p. 329 (E.R.D.A. Contract No. EG-77-X-01-3036). Also, the five large private utilities, 110 publicly-owned utilities, B.P.A., and the 18 member Washington Public Power Supply System (W.P.P.S.S.) are all members of a Joint Planning Council for the region. id.. Hereinafter cited as "Monopoly Report".

18/ Monopoly Report, op. cit., at p. 234.

19/ ibid., at p. 235, Table 26.

20/ On mineral-severed land at The Geysers.

21/ With McCulloch Geothermal Corp. at North Salton Sea and South Brawley in the Imperial Valley.

22/ With Geoproducts, Inc. on the wood chip hybrid and with McCulloch and G.K.I. on "Bottle Rock" (Lake County) and "South Geysers" (Sonoma County).

23/ Monopoly Report, op. cit., at p. 238, Table 27.

24/ id..

25/ With Republic Geothermal at East Mesa and Long Valley.

26/ At East Mesa.

27/ See Site-Specific Analysis Of Hybrid Geothermal/Fossil Fuel Power Plants, City of Burbank (June 1977) (E.R.D.A. Contract No. E-(O-4-1311).

28/

Monopoly Report, op. cit., at p. 201.

29/

See the Power Plant And Industrial Fuel Use Act of Nov. 9, 1978, P.L. 95-620, 92 Stat. 3289 et. seq., generally 42 U.S.C. §8301 et. seq..

30/

Energy Tax Act of 1978, P.L. 95- , 92 Stat. et. seq.. See 26 U.S.C. §48(a) for the I.T.C..

31/

CAL. PUB. UTIL. CODE §§2801-2816.

32/

S.A.I., Market Survey For Direct Utilization of Geothermal Energy In California (Contract No. 500/73(819)) Jan. 17, 1980, hereinafter cited as "S.A.I. Study".

33/

S.A.I. Study, at p. 1, at Exec. Summary.

34/

id..

35/

ibid., at p. 29.

36/

ibid., at p. 19.

37/

ibid., at p. 3.

38/

See, in particular Stanford Environmental Law Society, Geothermal Energy: Legal Problems of Resource Development (1975) (hereinafter cited as "Stanford Report").

39/

Monopoly Report, op. cit., at pp. 226 and 244.

40/

Dated Aug. 25, 1966 and filed with the F.P.C. Jan. 18, 1968.

41/

U.S. share of hydro power generated along U.S.-Canadian Border. See

- 42/ Pacific Intertie Agreement.
- 43/ id..
- 44/ Contract No. 175r-2650 (April 5, 1958); Contract No. 175-3428 (Oct. 1, 1951).
- 45/ No. 175r-2650.
- 46/ No. 175-3428.
- 47/ Monopoly Report, op. cit., at p. 255.
- 48/ ibid. at pp. 257-264.
- 49/ Contract No. 14-06-200-2948A (July 31, 1967).
- 50/ Monopoly Report, op. cit., at p. 267.
- 51/ ibid., at p. 268.
- 52/ ibid., at p. 299.
- 53/ ibid., at p. 304.
- 54/ Thomas Brom, "The Squeeze In California: Edison v. Public Power", The Nation (March 2, 1974), p. 269 (hereinafter cited as "Brom").
- 55/ Monopoly Report, op. cit., at p. 308.
- 56/ Dept. of Justice, "Letter of Advice", A.E.C. Docket Nos. 50-361 A and 50-361-B.
- 57/ Monopoly Report, op. cit., at pp. 309-314.
- 58/ With Union at Brawley and Salton Sea.
- 59/ Sunflower Electric Coop., Inc. v. Kansas Power & Light Co., et. al., 603 F. 2d. 791 (10th Cir. 1979).

CHAPTER FOUR: THE PHYSICAL REALITIES

Thus far we have briefly sketched the outlines of the problem, chronicled previous attempts at a legal (legislative, administrative or judicial) solution, and analyzed the electric utility/ industrial users who form the non-governmental institutional setting into which hydrothermal geothermal commercialization is about to tread. We shall now turn our attention to the physical realities of the Pacific Rim's existing power lines and note their proximity to the Region's various target prospects. By looking at each in turn, we shall pinpoint probable problem areas and suggest possible legislative or regulatory solutions if such are necessary.

(A) The Geysers: An Old Story But A New Ending:

P.G. and E.'s presumed dominance over Northern California transmission generally and Geysers-area transmission in particular is borne out by a close examination of the D.O.E. transmission line maps for California.^{1/} The Geysers, like most other geothermal target prospects, is "off the beaten path" as far as transmission lines are concerned.

The main lines in Northern California consist of two large corridors: (1) the two (2) 500 k.v. P.G. and E. lines which form part of the Pacific Intertie (discussed above), and lie on the east side of the Sacramento River; (2) and no less than eight (8) 230 K.v. lines running parallel to the 500 k.v. lines from north to south through the Sacramento

River Valley, but lying on the west side of the river itself. Four of those eight lines are owned by P.G. and E., the other four by the C.V.P. of the U.S. Bureau of Reclamation.

As these eight lines pass southward toward Sacramento and to the east of The Geysers, they criss cross, with the four P.G. and E. lines now lying to the west of the C.V.P. lines. These four, 230 k.v. P.G. and E. lines then continue due south to a large substation at Vaca Dixon, where they meet no less than eight (8) other lines — two (2) 230 k.v. and four (4) 115 k.v. headed south into the San Francisco Bay Area and two (2) 230 k.v. lines heading west towards The Geysers and terminating at the Lakeville substation southwest of The Geysers in Sonoma County. From there, a fairly fragile network of several 115 k.v. lines circumscribes the entire Geysers K.G.R.A., tying in at the Fulton substation south of The Geysers field itself, with two (2) 115 k.v. lines running north of Clear Lake from Mendocino eastward to the four (4) 230 k.v. lines noted earlier and two (2) more 115 k.v. lines running directly south from the existing Geysers units to Fulton and thence east to Vaca Dixon. A single 115 k.v. line to the west of the area connects the existing Geysers plants with the twin Mendocino-Clear Lake lines to the north. All of these Geysers lines are owned by P.G. and E..

As part of its Unit 16 plant application, P.G. and E. proposed the first 230 k.v. line in The Geysers, to run south

to the Fulton and Lakeville substations and then east to Vaca Dixon. It is the only new line proposed for the area.

Clearly, P.G. and E.'s lines — both existing and planned — will carry all present and future Geysers power. Though the mid-70's Justice Department Antitrust Division's investigation of P.G. and E., coupled with Otter Tail's legacy, finally pried P.G. and E. off the dime on the N.C.P.A.'s long outstanding wheeling requests, and even though D.W.R., S.M.U.D. and others are optimistic about the wheeling prospects over P.G. and E. lines from their future Geysers' plants, it might be a wise choice for D.O.E. and those smaller utilities to pay extremely close attention to the Nuclear Regulatory Commission's (N.R.C.) upcoming licensing process for P.G. and E.'s large twin nuclear plants at Diablo Canyon in central California. This proceeding will have to undergo Antitrust Division scrutiny, as outlined in Chapter Two under the 1970 Amendments to the Atomic Energy Act.. F.E.R.C.'s newly-granted wheeling authority and the threat of an Otter Tail-type antitrust suit will provide strong backup. All in all, the situation here, once so bleak, now looks promising.

(B) Mono-Long Valley and Coso: A Choice Of Lines:

In eastern California, behind the imposing wall of the Sierra Nevada, lie two key hydrothermal commercialization target prospects — Mono-Long Valley and Coso. Both are on

Federal land (Forest Service and Navy/BLM, respectively) and both will be the subject of upcoming B.L.M. lease sales. In terms of transmission access/institutional setting, both areas present a less-monolithic picture than The Geysers. The Pacific Intertie's direct current (d.c.) 800 k.v. passes to the east of Mono and to the west of Coso. The line is owned jointly by D.W.P., Edison and the Southern California "Middle Three" — the cities of Glendale, Burbank and Pasadena. But according to Bierman, et. al., in their 1977 report to D.G. E., this line cannot be economically tapped into by small plant-specific spur lines for technological reasons.^{2/}

The only viable alternative for Mono-Long Valley transmission thus becomes Southern California Edison's (S.C.E.) single 138 k.v. line running from the Lee Vining substation just south of Mono Lake to The Control substation just west of Bishop, where it becomes twin 138 k.v. lines and continues south to Lone Pine, passes Coso on the west and, at Inyokern, becomes a 115 k.v. and 230 k.v. pair as it continues towards the Los Angeles — San Bernardino area. Also, at Inyokern, just off the Naval Weapons Center, two (2) more 115 k.v. lines, also owned by S.C.E., bring power to the mining communities of Trona and Searles to the east, but do not appear interconnected with Kerr-McGee's chemical plant and its 48 MWe steam-fired generator at Trona.

D.W.P., in addition to its share of the direct current Intertie line, has a single 230 k.v. line running from its Upper Gorge (37.5 MWe) and Middle Gorge (37.5 MWe) hydro plants south of the Mono-Long Valley K.G.R.A., through a third hydro facility at Control Gorge (37.5 MWe) just north of Bishop and then tracking the 800 k.v. d.c. line to the south, west of Coso and Inyokern and on to Los Angeles. Whether or not its 230 k.v. line could feasibly be extended, or tapped into on the north, to take Mono-Long Valley geothermal power is a question beyond the scope of this report. But the availability of both D.W.P. and Edison lines (and their rights-of-way) over Federal land bodes well for both Coso and Mono-Long Valley from the technological, as well as the institutional perspectives. Coso in particular looks well situated. It has the D.W.P.'s 230 k.v. line and two S.C.E. 138 k.v. lines to choose from.

(C) Imperial Valley: Room At The Inn:

If The Geysers and Coso/Mono can be said to have adequate lines nearby, Imperial Valley faces an opposite situation. Virtually no lines exist in the Valley. Two Imperial Irrigation District (I.I.D.) 161 k.v. lines run on either side of the Salton Sea in a northwesterly direction towards Palm Springs and the Coachella Valley, with spurs to the east from Niland and El Centro (crossing East Mesa) to connect with U.S. Bureau of Reclamation lines near the Colorado River. Institu-

tionally, there is no present problem. But new lines will be needed. I.I.D. will probably not build them itself, and those new lines will eventually have to tie in to Edison's twin, 230 k.v. lines running from the Palm Springs area west to Los Angeles. Edison is, of course, involved in geothermal plant plans at Niland and Brawley as well (with Union Oil), so their involvement here will be a major, and probably the key factor in the transmission line picture for Imperial Valley's numerous target prospects. Only Los Angeles can absorb, and needs (for air quality reasons) to absorb the future geothermal capacity of the Imperial Valley. Edison has the lines over which that power will have to travel. And it is Edison which owns the many large, oil-fired plants on the Pacific Ocean in the Los Angeles Basin that will eventually have to be phased out. The latter include Alamitos (1982.4 MWe), Redondo Beach (1579.4 MWe), El Segundo (996.5 MWe), Long Beach (702 MWe) and Huntington Beach (1008 MWe).

S.C.E.'s final nuclear licensing procedure before the N.R.C. for San Onofre Units 2 & 3, F.E.R.C.'s new wheeling authority, threats of antitrust suits by the numerous southern California municipalities, and the leverage of air-quality trade offs should be cumulatively capable of prying loose satisfactory wheeling access for Valley geothermal capacity from Edison.

(D) Oregon Prospects: Alvord & Vale:

These prospects, located in a sprawling, sparsely-populated desert region of south eastern Oregon, are, like the Imperial Valley in the Colorado Desert, in a virtual "no man's land" as far as transmission lines are concerned. The Pacific Intertie's twin 500 k.v. lines pass directly through many of the Willamette, Deschutes and Fremont National Forests prospects, while the Intertie's 800 k.v., direct current line lies just to the east. But none of these are of any help for Alvord or Vale.

Alvord's only outlets seem to be a single 115 k.v. line owned by the Harney Electric Coop. and running south from Harney to Fields, and a 115 k.v. B.P.A. line running west from Harney, passing under the three large Intertie lines and connecting with a 230 k.v. line at the Redmond substation.

Institutionally there is probably no problem in Oregon, and both the Harney Coop and B.P.A. will probably be amenable, but the availability of excess capacity on these 115 k.v. lines is unclear at this time.

FOOTNOTES

CHAPTER FOUR

1/ Energy Information Administration, U.S.D.O.E., Principal Electric Facilities - Arizona, California, Nevada (D.O.E./E.I.A. -0057/9) June, 1978.

2/ Monopoly Report, op. cit., at p.