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STATE OF CALIFORNIA INITIATIVE IN GEOTHERMAL DEVELOPMENT:
ITS OBJECTIVES, ACCOMPLISHMENTS AND SCHEDULES

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C. SUZANNE REED, COMMISSIONER

CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION
1111 HOWE AVENUE
SACRAMENTO, CA

ABSTRACT

California has the most abundant known reserves of geothermal resources in the nation, and California State government has taken several important actions to accelerate the environmentally acceptable development of geothermal energy. This paper discusses the roles played by various California State government agencies and the legislature to accomplish this goal.

STATE AGENCY INVOLVEMENT

Several state agencies have regulatory authority or responsibilities that either are specific to, or directly affect, geothermal development. As summarized in Figure 3, these agencies include the State Lands Commission (SLC), which leases geothermal resources and oversees operations on state-owned or state agency-owned lands. Within the Department of Conservation, the Division of Oil and Gas (DOG) regulates well drilling activities, and the Division of Mines and Geology together with SLC and DOG, develops assessments of geothermal resources and conducts seismic surveys.

INTRODUCTION

California today is the only state in the United States with commercially operating geothermal power plants. Current capacity in the Geysers is 502 MW. The first production of electricity from geothermal steam in 1960 resulted from the initiative of two private entities, a developer, Magma Power, and a utility, Pacific Gas and Electric Company. This is important to remember as government seeks to define and exercise a role in the commercialization of geothermal resources.

The California Public Utilities Commission (CPUC) sets rates for investor-owned utilities and grants certificates of public convenience and necessity. In addition, several agencies exercise federally-delegated authority over geothermal development including the Air Resources Board (ARB), the State Water Resources Control Board (SWRCB), and the Solid Waste Management Board (SWMB). Other Departments within the Resources Agency, for example, Fish and Game, are particularly interested in the environmental impacts of geothermal development. Meanwhile, the Governor's Office of Planning and Research (OPR) is concerned with state and local land use planning activities, the preparation and review of environmental impact reports, and the smooth operation of various state and land government permitting processes.

Today, every major utility in the state and several municipal utilities have plans to construct and operate or rely on power produced from geothermal power plants. According to information from various utilities and developers Figures 1 and 2 (referenced as an insert) show that 1937 new MW of geothermal power plants in the Geysers and 1150 MW in Imperial Valley are in various stages of construction, permitting or planning. If all of these projects come on line as planned, geothermal energy should meet 5% as compared to the current 1% of California's electricity needs in 1990. With increased federal leasing in other areas, such as the Eastern Sierra, an even greater potential could be realized.

The heads of these agencies sit together with the Chairman of the SWRCB, the Director of Water Resources, the Director of Fish and Game, and the President of the CPUC on a Geothermal Resources Board (GRB), chaired by the Director of the Department of Conservation. The Board was originally established in 1965 to oversee the orderly development of California's geothermal resources. Specifically the Board was given responsibility to:

In addition, a number of cities, towns, and private industries are pursuing direct heat uses of geothermal energy with the aid of federal or state funds, for example, Susanville in Lassen County, Desert Hot Springs in Riverside County, Mammoth Lakes Village in Mono County, and El Centro and Holly Sugar in Imperial Valley.

1. Classify areas as geothermal resource areas;
2. Grant certificates of primary purpose;
3. Hear appeals on orders of the Oil and Gas Supervisor; and
4. Approve unitization plans for geothermal development.

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The Board was created for the primary purpose of resolving conflicts between water resource and geothermal resource uses. As I will discuss later, the Technical Advisory Committee to the Board was expanded to include all state agencies concerned with geothermal development and three members of the public. This action responded to a recommendation of the Geothermal Task Force, that an interagency coordinating group on geothermal be permanently established in state government.

The California Energy Commission (CEC) has sole state authority to grant or deny certification for all electric power plants over 50 MW, including geothermal power plants. In addition, the Commission is responsible for developing and coordinating a program of alternative energy resources research and development that gives priority to, among other alternatives, geothermal energy.

Finally, the Department of Water Resources (DWR) is unusual among state agencies involved in geothermal resource development. Rather than promoting or regulating the use of geothermal energy, DWR is in a position to develop it. Currently, the department, whose major responsibility is water supply, plans to construct three 55 MW geothermal power plants and one hybrid geothermal/biomass cogeneration facility. The power will be used to run the State Water Project. In addition, DWR has committed itself to a \$1.5 million cost-shared exploration effort in the Imperial Valley. Recently the Department was a successful bidder on a Bureau of Land Management lease sale in the Geysers-Calistoga, KGRA. The practical experience these actions bring to the state public policy forum will continue to aid the state's efforts to maximize the use of its geothermal energy resources.

GEOHERMAL TASK FORCE

In 1976, the Legislature enacted AB 3590 (Kapiloff) creating an interagency task force with representatives of the Legislature, the private sector, local government, and the public also as members. The legislation directed this Geothermal Resources Task Force, chaired by Conservation Department Director, Dr. Priscilla Grew, to examine the status and means of accelerating the use of this resource. The Task Force covered a range of technical, economic, environmental, and institutional issues. Following a year of public hearings and deliberations, the Task Force issued a draft report in late 1977, and made a number of recommendations to achieve the objectives of AB 3590.

CALIFORNIA ENERGY COMMISSION

a. Regulatory Activities --

On March 22, 1978, the California Energy Commission recognized geothermal as a preferred resource and unanimously adopted a policy to cut total time for processing geothermal power plant proposals by one-third.

The adopted Geothermal Policy Report was based on Commission staff research, the recommendations of the State Geothermal Task Force, and on comments received during a series of public hearings conducted in Sacramento and in Imperial and Lake Counties by the Commission's Geothermal Policy Committee. Participants in these hearings included representatives of local, state, and federal government, geothermal developers, utilities, and public interest groups, and local residents.

In accordance with this Geothermal Policy, the Energy Commission:

1. Exercises direct regulatory jurisdiction over power plants and electric transmission lines only and leaves steam well regulation to the Division of Oil and Gas and local authorities;
2. Seeks to eliminate duplication of effort among local, state and federal permitting agencies, thru the preparation of a single environmental document that meets the environmental review obligations of all pertinent agencies, and thru use of Commission proceedings as a common forum for examining issues of concern to other regulatory bodies;
3. Has established a flexible review process that enables geothermal power plant proposals to be reviewed in twelve months as opposed to eighteen, if the applicant supplies sufficient information at the beginning of the process; and
4. Encourages applicants to seek from the Commission certification of a facility and site and approval of the site as capable of accommodating additional capacity, thus shortening the review period required for each additional facility at that site.

The Commission formed a Geothermal Advisory Committee (GAC) representing all pertinent interests to assist it, and following public hearings in Lake, Sonoma and Imperial Counties, unanimously adopted regulations to implement these policies on October 4, 1978.

Currently, the Commission is processing 4 geothermal power plant proposals totalling 385 MW. Two are proceeding under the 12-month expedited process. The Commission expects to receive 3 more filings early in 1979. For one of the projects currently under review, Northern California Power Agency's proposal to construct a geothermal power plant on federal lands in Sonoma County, the Commission staff is jointly preparing an environmental impact assessment document under a Memorandum of Understanding with the U.S. Department of Energy (DOE), the Bureau of Land Management (BLM), and the U.S. Geological Survey (USGS). This one document will fulfill the environmental review requirements of each of the participating agencies and is scheduled for completion within one year.

b. Research and Development

In carrying out its research and development responsibilities, the Commission is focusing on eliminating institutional barriers and assisting local governments to develop a data base that will contribute to informed and expeditious decisions on geothermal projects. Major efforts include the joint DOE-/Commission-sponsored Geothermal Resources Impact Projection Study (GRIPS), a four-Northern California County environmental baseline data gathering, impact assessment and planning project. The purpose of this program is to assist Lake, Sonoma, Napa, and Mendocino Counties to prepare for and deal with geothermal development projects expeditiously and in a manner that will reduce or avoid adverse local impacts.

In Southern California, the Commission and DOE are jointly funding the Imperial Valley Action Plan. This is a cooperative planning effort to establish transmission line corridors to major utility service areas North and West of the Valley and to identify and eliminate constraints on hot water resource utilization, such as water availability. The goal is to enable 500 MW to be brought on line in each of the four major anomalies by the early 1990s. Managed by the Imperial County Planning Department, this program seeks to involve all developers, utilities, local, state, and federal agencies and members of the public who may have an interest in geothermal resource development in Imperial Valley.

For Fiscal Year 1979/1980, the Commission has proposed an expanded geothermal program with additional emphasis on:

1. Power on line geothermal resource evaluations to establish specific goals in each geographic region and determine the extent to which geothermal energy can be used by utilities to displace more conventional fuel supplies;
2. Extension of local government advance planning assistance programs to areas with geothermal potential beyond the Geysers and Imperial Valley;
3. Increased industry and federal government coordination for technology development in areas such as H₂S abatement and down hole pumping; and
4. Promoting the direct use of geothermal energy in state buildings.

INTERAGENCY COORDINATION

As an outgrowth of the Geothermal Task Force, cooperation among state agencies has continued in the form of the Technical Advisory Committee (TAC) to the GRB. TAC serves as a forum for exchanging information and providing recommendations for policy and program development to each of the member agencies. In addition, this group seeks to reach agreement on geothermal planning and research priorities. It is especially active in reviewing federal pro-

grams and policies and meets quarterly with California federal land managers. A primary goal is to eliminate duplication among government programs.

TAC recently completed its review of several joint state/federally funded programs and projects now being initiated by its member agencies. These include:

1. A series of public workshops to examine such issues as economic incentives, federal leasing policies and practices, local planning and institutional barriers; and to identify specific further actions needed in each of these areas;
2. A geothermal resource assessment to identify areas suitable for direct heat applications;
3. An implementation program for direct applications; and
4. Research to determine the extent to which geothermal development can impact on natural hot springs and means by which such impacts can be mitigated or avoided.

Finally, state agencies have joined to urge (not always successfully) the federal government to take certain actions or carry out specific programs that will accelerate geothermal development. Working with the California Congressional delegation and Senators Cranston and Hayakawa, the state has supported:

1. federal funding of the Heber binary-cycle demonstration program;
2. increased funding for the Bureau of Land Management to accelerate its geothermal leasing program;
3. inclusion in the National Energy Act of strong economic incentives, including depletion allowances for geothermal energy;
4. revamping the Loan Guarantee Program so that it is more easily used by developers and utilities; and
5. providing a cohesive geothermal program management structure in the Department of Energy that is responsive to regional differences and needs.

STATE LEGISLATURE

The State Legislature was particularly active during the 1978 Session in the area of geothermal energy. Following recommendations of the Geothermal Task Force, the State Lands Commission, the Energy Commission and other state agencies, the Legislature enacted and the Governor signed into law several measures to eliminate institutional barriers to geothermal development.

These include:

1. SB 1027 (Roberti) which revises the manner in which the State Lands Commission issues and manages leases;
2. AB 3707 (Kapiloff) which reduces the bonding requirements for low temperature wells, eliminates duplicative waste discharge permit requirements for geothermal wells, allows a geothermal energy producer recourse to the PUC from curtailment of geothermal energy generation, production or transmission by an electrical corporation (utility), and exempts private energy producers from regulation by the PUC under certain circumstances; and
3. AB 2644 (Goggin) which shortens the time period for preparing and processing the environmental documentation for geothermal exploration projects to four months and places this authority in the Division of Oil and Gas, provides a one phase twelve-month Energy Commission power plant certification process for geothermal power plants, and authorizes the Commission to delegate its geothermal power plant siting authority to any county that has a geothermal element in its general plan and can provide an equivalent power plant certification process.

CONCLUSION

As this summary of recent actions indicates, expediting geothermal resource development is a high priority state energy policy. State officials recognize that industry has demonstrated its capability to be innovative and assume risks in bringing this energy technology into full use when provided with the proper incentives.

The message I have for you is simple. We want geothermal development to be good business in California. Whenever I ask industry representatives - "What can government do to help?" The answer I get most often is - "Get out of the way!" We hear you, and we're moving as fast as we can. The rest is up to you.

STATE AGENCY

AREA OF RESPONSIBILITY

STATE LANDS COMMISSION _____

LEASING OF STATE LANDS

DIVISION OF OIL & GAS _____

WELLS & RESERVOIR PROTECTION

ENERGY COMMISSION _____

POWER PLANT CERTIFICATION

AIR RESOURCES BOARD _____

AIR QUALITY

PUBLIC UTILITIES COMMISSION _____

RATE REGULATION & CERTIFICATION OF
PUBLIC CONVENIENCE & NECESSITY

WATER RESOURCES CONTROL BOARD _____

WASTE DISCHARGE

SOLID WASTE MANAGEMENT BOARD _____

SOLID WASTE DISPOSAL

DIVISION OF MINES & GEOLOGY _____

GEOLOGIC STUDIES & RESOURCE ASSESSMENT

DEPARTMENT OF FISH & GAME _____

FISH & WILDLIFE IMPACTS

DEPARTMENT OF WATER RESOURCES _____

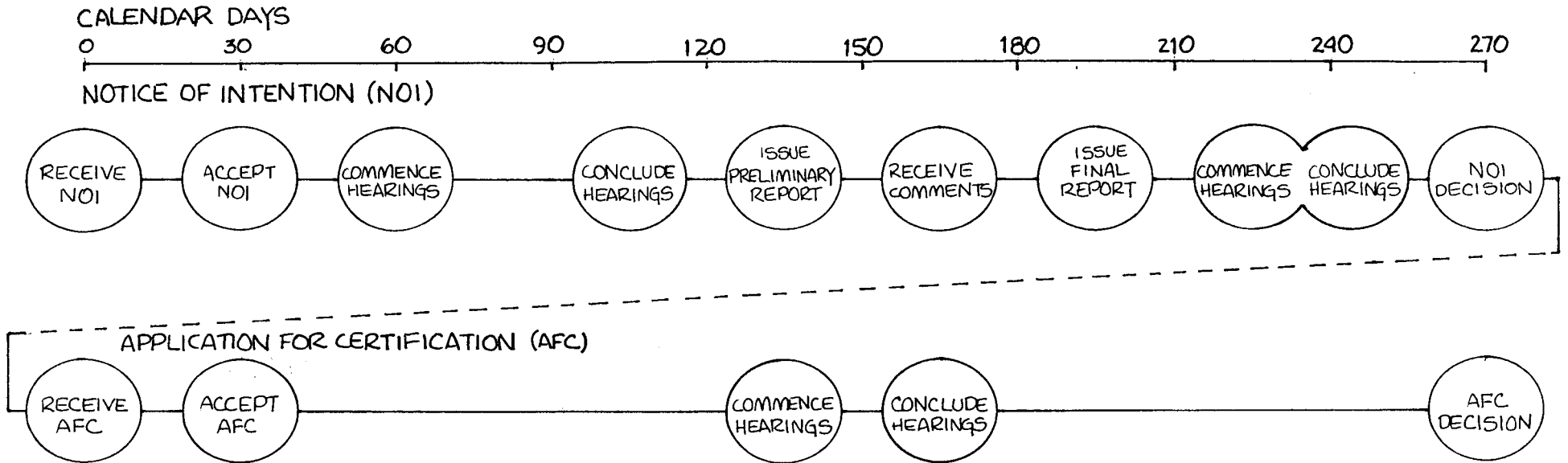
WATER SUPPLY & ENERGY DEVELOPMENT

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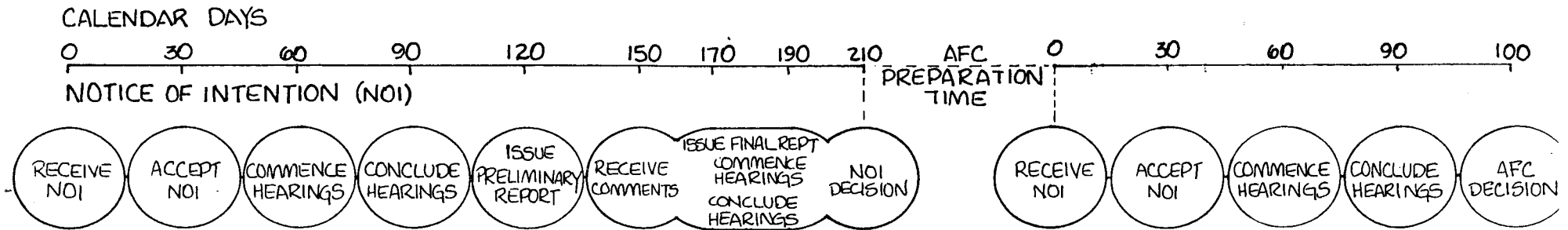
LAND USE PLANNING, ENVIRONMENTAL REVIEW,
PERMIT ASSISTANCE

GEOHERMAL POWER PLANT CERTIFICATION PLANT

CURRENT - 18 MONTH MAXIMUM TIMETABLE



EXPEDITED - 12 MONTH TIMETABLE



IMPERIAL VALLEY
PROJECTED POWER ON LINE¹

Location	Developer	Utilizer	Size (MW)	Type	Date Power On Line	Funding
Heber	Chevron	SCE	50	F	1982	Total Corp. Funds
	*Chevron/EPRI	SDG&E	49	B	1982	DOE Funding Rejected 1978
	Chevron	SCE	55		1985	
	Chevron	SDG&E	100		1986	
	Chevron	SCE	100		1986	
East Mesa	*RGI	SDG&E	48	F	1980	RGI Receive GLGP Total Corp. Funds
	*Magma Expand to	SDG&E	10 50	B	1978	Total Corp. Funds
Brawley	*Union	SCE	10	F	1980	SCE Own & Operate Total Corp. Funds
		SCE	100	F	1983	
		SCE	100	F	1985	
		SCE	100	F	1984	
		SCE	100	F	1986	
S. Brawley	*CUL Venture (McCulloch & Geo-Mac)	DWR	55	F	1984	CUL Receive GLGP Water Contractors
Salton Sea	*Magma/Narco	SDG&E	50	F	1982	Total Corp. Funds
	Mono/Union/S. Pacific Land Company Expand to	SCE	10	F	1982	Total Corp. Funds
		SDG&E	50			
	*Magma	SDG&E	10	F	1986	DOE Demo
E. Salton Sea	*McCulloch	DWR	55	F	1984	Water Contractor
Westmor- land	RGI/MAPCO	SDG&E	48	F	1983	RGI Receive GLGP
			TOTAL			
			<u>1150</u>			

1. Based on staff/utility discussions or utility resource plan submittals to CEC.
* Some commitment has been made between the developer and utility.

PROJECTED POWER ON LINE¹

Year n Line	Owner/Operator	Developer	Size	Type	Power Plant Status	Funding
1978	Geysers 12	Union	106	Steam	Being Built	Total Corp. Funds
1979	Geysers 15	Thermogenias	55	Steam	Being Built	Total Corp. Funds
1979	Geysers 13	Aminoil	135	Steam	Being Built	Total Corp. Funds
1979	Geysers 14	Union	110	Steam	Being Built	Total Corp. Funds
10/81	NCPA	Shell	55	Steam	NOI Submitted 8/15/78	CLGP \$41 Million
1982	Geysers 17	Union	110	Steam	NOI Submitted 5/26/78	Total Corp. Funds
1982	Geysers 16	Aminoil	110	Steam	NOI Submitted 9/18/78	Total Corp. Funds
5/82	NCPA	Shell	55	Steam	NOI Submitted	
1982	NCPA	RFL	66	Steam	NOI Submitted 1/79	Long-Term Bond Financing \$16 Million
1983	Geysers 18	Union	110	Steam	NOI Submitted 10/78	
1983	Geysers 19	Aminoil	110	Steam	NOI Submitted 3/79	
1983	DWR	McCulloch	55	Steam	NOI Submitted 10/78	Water Contractors
1984	DWR	McCulloch	55	Steam	NOI Submitted 3/79	Water Contractors
1984	Geysers 20	Union	110	Steam	NOI Submitted 3/79	
1984	Geysers 21	Union	110	Steam	NOI Submitted 3/79	
1985	Geysers 22		110	Steam		
1985	SMUD		100	Steam		
1986	Geysers 23		110	Steam		
1986	DWR	McCulloch	55	Steam		
1986	SMUD		100	Steam		
1987	Geysers 24		<u>110</u>	Steam		
		TOTAL	<u>1937</u>			

1. Based on staff/utility discussions or utility resource plan submittals to CEC.