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AREA DEVELOPMENT PLANS IN UTAH

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Area Development Plans (ADP's) are a planning tool, the purpose of which is to provide estimates of the amount of future energy demand which may be satisfied by geothermal resources within a a given county or multi-county area.

In Utah, the highest priority in the ADP process was given to those areas where development is most imminent. The three areas selected for initial consideration are the Jordan Valley (Salt Lake County), the upper Sevier River system (Sanpete, Sevier, Piute, and Wayne Counties), and Southwestern Utah (Beaver, Iron, and Washington Counties). Certain projections have been completed for additional areas, but the initial emphasis has been on these three. The discussion which follows will center on the Jordan Valley as an example.

The Jordan River Valley

Salt Lake County is located along the Jordan River in the north central part of Utah, on the southeast corner of the Great Salt Lake. Population, commerce, and administration are all concentrated in Salt Lake County and to a slightly lesser degree along the rest of the Wasatch Front. Population estimates for 1980 indicate that 41% of the projected population for Utah are located in Salt Lake County, and that the main Wasatch Front counties--Utah, Salt Lake, Davis, and Weber Counties--combine to account for 76% of the state's projected population.

Salt Lake County is also a center for transportation for the state, with an international airport, several rail lines, and major interstate highway systems converging in the county. A broad range of industry, from small home-type businesses to extensive primary minerals operations such as Kennecott Copper are also found in the valley. State and federal agencies maintain state headquarters in the county. The valley is a center for wholesale and retail businesses. The University of Utah and Westminister College are among the larger educational institutions located in Salt Lake City. The county also provides much of the living space for the tourist industry in the state, particularly the ski industry, much of which is located within or very near to the county.

Several geothermal resource areas are located in the county, some of which are already under development. Some of the projects which are in progress are listed below.

* Utah Roses at Sandy City: Utah Roses Inc. is a greenhousing firm specializing in roses. In 1978 the company applied for and was granted cost-share funds by the DOE under the PON program. The PON provided partial funding to drill a production well and retrofit the existing 6 acre facility at 90th South in Sandy. The production well has been drilled; it was 5009 ft. deep with a peak bottom hole temperature of 157^{0}F. The greenhouses are presently heated by natural gas on interruptible service, and the replaceable heat load is expected to be about 70×10^{9} Btu's per year.

* Utah State Prison at Crystal Hot Springs, Bluffdale: The Utah Department of Social Services plans to heat part of the State Prison at Bluffdale with heat from the system which supplies the nearby Crystal Hot Springs. The project was granted partial funding by the DOE under the PON program. The first phase of the program includes drilling a production well and retrofitting the existing heating system in the minimum security building at the prison. The system would replace an estimated 7×10^{9} Btu's per year.

* Utah Roses at Crystal Hot Springs, Bluffdale: In the early fall of 1979, Utah Roses Inc. acquired some land at Crystal Hot Springs for the purpose of expanding the greenhousing operation. In November a well was drilled to comparatively shallow depths which yielded water at flow rates and temperatures adequate to heat the initial set of greenhouses. Development at the site will probably be limited by the capacity of the resource; Utah Roses plans for up to 20 acres of greenhouses, with an estimated heat load of about 234×10^{9} Btu's per year.

Other projects are contemplated which would utilize the geothermal resources at Wasatch Hot Springs and at Beck's Hot Springs near the north boundary of the county.

Projections of population for the county indicate that about a million people will live in the county by the year 2000. Geothermal energy in the form of hot water, suitable for direct use, could supply only a small fraction of the estimated 36.4×10^{12} Btu's per year which will be required for space and water heating. However, the availability of groundwater at temperatures of 50 to 60^{0}F may make the geothermal ground water heat pump an extensively used method of heating. Already a number of large buildings in the Salt Lake area use heat pump systems, including the 26-story office building of the Church of Jesus Christ of Latter-day Saints in downtown Salt Lake City and the International Center near the Salt Lake International Airport. Other developments are planned which will utilize ground water heat pumps, ranging in size from individual homes to large district heating systems.

Another resource which may eventually be developed in the valley is heat due to the normal temperature gradient of the earth. As fuel prices rise, it may become economical to drill to greater depths, like the Utah Roses well at Sandy, to tap moderate temperature resources. It will probably not become economical to drill to these greater depths for several years, but these deeper resources, if shown to be widespread, could be an important alternative to conventional fuels. The data from the well at Sandy may aid considerably in assessing this resource in the Jordan Valley.

Salt Lake County

	1978	1980	1990	2000	2020
Population	550,200	589,800	819,400	958,200	1,226,600
Population per Household	3.27	3.23	3.14	3.00	2.64
Households	168,400	182,500	319,300	387,000	464,000
Equivalent Natural Gas (10^3 Mcf/yr.)	28,300	30,700	43,800	53,700	78,000
Space and Water Heating (10^{12}Btu's/yr.)	19.5	21.1	30.1	36.9	53.6
Electrical Use (Mkwh/yr.)	88,500	123,000	176,200	215,700	313,400
Industrial Heat (10^{12}Btu's)					15.6

Average Annual Degree Days: 6563

Natural Gas per Household: 168 Mcf/yr.

Natural Gas Heat Content: 1091 Btu's/c.f.

Heat Consumption per Household: 183×10^6 Btu's/household yr.

Space and Water Heating per Household: 116 Btu's/household yr.

Annual Electrical Consumption per Household:
1978: 0.5256 Mkwh
1980: 0.6740 Mkwh
1983-2020: 0.6755 Mkwh

Utilities:

Natural Gas: Mountain Fuel Supply
Electric: Utah Power and Light
Heating steam: Utah Power and Light

Resource Areas	Temperature °C	Ownership	Development
Crystal Hot Springs	86	State & Private	Utah Roses - Greenhouses
			State Prison - Space Heating
Beck's Hot Springs	55	State	
Wasatch Hot Springs	40	Salt Lake City	
Sandy City		Private	Utah Roses-Greenhouses