Springs and in the Tehachapi Mountains southeast of Bakersfield, making Californi far and away the wind-power capital of the world. Altogether these wind turbine produced about 1.5 percent of the state's electrical power, representing 30 percer of the world's supply of wind-generated electricity.

In 1960 the nation's first commercial geothermal power plant began operatior at The Geysers in Sonoma County, where superheated steam released at the earth surface was fed to turbines to generate electricity. California soon had 15 geothe mal plants in operation with a total output of more than 900 megawatts of powe representing enough electricity to meet the needs of a city nearly the size of Sa Francisco. (One megawatt equals 1000 kilowatts, enough power to supply th electricity needs of about 1000 residential customers.) Geothermal resources elsc where in California—notably in the Imperial Valley, along the eastern Sierra, and i the northeastern part of the state—boosted the total geothermal energy potential c the state to 15,000 megawatts. By the early 2000s, geothermal plants were produc ing about 5 percent of California's electrical power, representing 40 percent of th world's geothermally generated electricity.

Another important renewable energy source was biomass, the generation of elec tricity from organic residues obtained from harvesting agricultural and forestr crops. Rather than being dumped into already overburdened landfills, the residue (such as forest slash) could be used as fuel in power plants. At their peak, biomas facilities generated more than 2 percent of the state's total electricity productior Additional power was provided by cogeneration, the use of waste heat, steam, c gases from an industrial plant for the generation of electricity. Used in Europe fc decades, cogeneration only recently attracted much attention in the United State To encourage its development, the California Public Utilities Commission (PUC ordered the state's utilities to offer incentives to their large industrial customers s that they could profitably produce their own electricity.

California's commitment to the development of alternative sources of energy le to a remarkable change in the pattern of energy production. In 1977 California re lied on petroleum for about 50 percent of its electricity generation. Three years late only 16 percent of the state's electricity came from this nonrenewable source, an by the early 2000s the proportion had been reduced to less than 1 percent.

## Nuclear Power

The most controversial energy source was nuclear power. Energy planners in th early 1960s predicted that by the end of the century, nuclear power would be able t supply half the nation's energy needs and would be "too cheap to meter." Fort years later that prospect had virtually disappeared.

The nation's first licensed commercial nuclear reactor began operations in 195 at Vallecitos in Alameda County. The plant was shut down in 1977 by the federa Nuclear Regulatory Commission (NRC) after discovery of a nearby fault, makin the plant vulnerable to earthquakes. The first large-scale nuclear facility in Californi the San Onofre plant located halfway between Los Angeles and San Diego, bega


**'Someday, son, this will all be yours. And your son's. And your sons's son's. And your son's son's son's. And his son's. And his . . .'**

Concern over the safe disposal of radioactive wastes from nuclear power plants inspired this 1974 editorial cartoon by Dennis Renault in the *Sacramento Bee.* (*Courtesy of the* Sacramento Bee.)

operations in 1968 and by 1980 was providing Southern California Edison with 4 percent of its energy supply. Farther north, the Pacific Gas and Electric Company (PG&E) began construction in 1969 of a massive 2200-megawatt nuclear plant at Diablo Canyon near San Luis Obispo. Construction of the plant was nearly complete when PG&E reported the discovery of a major offshore earthquake fault. After extensive new buttresses and other safeguards were added, the first unit of the facility began producing electricity in 1985. The following year—more than 17 years after construction began—the entire plant went into full production.

Opposition to nuclear power arose out of concern for the safe disposal of radioactive wastes produced by the plants, which remain potentially lethal for thousands of years. Opponents also feared the disastrous consequences of an accident at a nuclear plant. In 1976 the legislature prohibited the California Energy Commission from authorizing construction of any further nuclear plants until the federal government had approved "a documented technology for the disposal of high-level nuclear waste."

Public opposition, and the enormous costs involved, seemed to have doomed the nuclear power industry. By the early 2000s, no American utility had proposed construction of a new nuclear plant for a quarter of a century. In California only the