

# Calpine Is Repowering The Geysers



## CALPINE'S GEOTHERMAL REPOWERING PROGRAM

Up to 80 Megawatts  
of Renewable  
Geothermal Energy

Repowering Eight  
Older Power Units to  
Enhance Efficiencies

Rejuvenating  
Production from  
Existing Wells — as  
Deep as Two Miles

Future  
Exploratory Wells  
to Identify New Areas  
for Geothermal  
Production

Five-Year,  
Multi- Million Dollar  
Program

## Calpine Is Repowering The Geysers, the World's Single-Largest, Renewable Geothermal Resource

Calpine's heritage of achievement in the power industry is grounded in renewable geothermal energy. In 1989, our company acquired its first megawatt of power production at The Geysers. Today, we own 19 of the 21 geothermal units and a vast network of steam fields, making Calpine California's largest renewable energy provider — a leadership position all of us at Calpine can take pride in.

The Geysers represents about 25 percent of California's green energy production. Unlike other renewable energy resources like wind and solar, geothermal power plants generate electricity continuously around the clock. As a result, Calpine's geothermal units run with near-perfect availability (97 percent availability), and because they interconnect with five separate transmission lines, they can deliver renewable electricity throughout California.

To ensure Californians continue to benefit from this valuable geothermal resource, Calpine is launching a five-year, multi-million dollar initiative designed to increase production at The Geysers by as much as 80 megawatts of much-needed renewable energy. Our world-renowned geothermal reservoir and well drilling experts will be tapping production and exploratory wells — some more than 11,000 feet deep — to expand steam production and to identify new sources of geothermal power.

Calpine also is rejuvenating our Geysers operations by repowering, or rebuilding, eight of our older geothermal turbines. By replacing older parts with new energy-efficient equipment to harness steam and generate electricity, Calpine can be an even better steward of this valuable renewable energy resource. Our program includes repowering units with a total current output of 252 megawatts, or approximately one-third of The Geysers capacity.

## Powering A Green Future

California has a tremendous opportunity to continue to lead the nation in environmentally responsible power generation. The vision and investment we make today in renewable resources like The Geysers will be a catalyst for future geothermal development.



# The Geysers Geothermal Operation

THE GEYSERS  
BY THE NUMBERS



World's Single-Largest  
Geothermal Operation

Supplies about 25%  
of California's  
Renewable Energy

Generates 40% of the  
Geothermal Electrical  
Generation in the U.S.

Calpine's Geothermal  
Units Serve the  
Annual Electricity  
Needs of 725,000  
Households

350 Steam Wells  
58 Injection Wells

First Commercial  
Steam Well Drilled  
in 1954

Calpine Owns and  
Operates 19 of 21  
Units

Steamfields Cover  
40 Square Miles

80 Miles of Steamlines



## North America's Largest Geothermal Operation

Calpine is a recognized leader in environmentally preferred power generation. The company owns and operates 19 geothermal power units at The Geysers region of Northern California. Combined, these geothermal facilities generate 725 megawatts of renewable power, making Calpine the largest producer of geothermal energy in the nation. Geothermal power plants take advantage of a natural, clean energy source — heat from the earth's interior — to produce electricity. Because these plants do not burn fossil fuel, they have an inherent environmental advantage.

## The Geysers Geothermal Resource Area

Located about 100 miles north of San Francisco in the Mayacamas Mountains, The Geysers is the single-largest geothermal operation in the world. A geothermal resource occurs when water deep below the earth's surface is heated by exposure to hot, porous and permeable rock resulting in dry steam or hot water. At The Geysers, dry or superheated steam is produced.

Steam production wells, some greater than two miles deep, are drilled to tap this naturally-occurring steam. Once the steam reaches the surface it is piped overland to a network of interconnected power plants where it spins a conventional steam turbine that drives a generator to produce much-needed electricity for California.

## Environmental Benefits in Public/Private Partnerships

Recognizing the importance of The Geysers, Calpine is expanding and sustaining production from this renewable resource through wastewater recharge projects whereby clean reclaimed wastewater from local municipalities is recycled into the geothermal resource where it is converted into steam for electricity production. This provides an environmentally sound wastewater discharge solution for neighboring cities and increases the long-term productivity of the geothermal operation.