

The Geysers Steamline

GEYSERS GEOTHERMAL ASSOCIATION

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www.theGGA.org

SUMMER 2010

Celebration will continue at GGA summer barbecue!

First there was the Spring Dinner, and now The Geysers 50-year celebration will continue at the GGA annual summer barbecue to be held at Calpine's Cartwright Geothermal Visitor Center in Middletown on Thursday, June 24.

Nothing formal has been planned—just a lot of good food and camaraderie as we enjoy the day.

Frontier Barbecue will be grilling steak and chicken, and serving pasta, fresh vegetables, salads rolls, ice tea and brownies. Yum!

Cost will be \$25 per person.



RSVP Margaret Lewis by June 15, 707 431-6132 or email her at:

Margaret.Lewis@calpine.com

But wait--there's more... Calpine is planning a big bash in September

Calpine will host a community 50th Anniversary of Commercial Operations at The Geysers on *Saturday, September 25, 2010* somewhere on the Sonoma County side of The Geysers.

Location is to be determined and further details will follow. For more information, check in regularly at www.geysers.com.

Calpine founder Pete Cartwright honored at Visitor Center dedication

Over 200 invited guests gathered in Middletown April 16 to dedicate the Calpine Visitor Center to the company's founder, Peter Cartwright. A pioneer in green renewable power production, Cartwright was honored during the private ceremony for his vision and commitment to promoting The Geysers and fostering environmental stewardship. Calpine executives, state and local elected officials and community leaders were among the guests.

Contributing to the accolades heaped upon Cartwright, was GGA president, Ron Sues, who said in a letter, "The jewel of your visionary contributions to geothermal energy is the Calpine Visitor Center in Middletown." He closed by saying, "The Geysers Geothermal Association is pleased to acknowledge that the Center will henceforth be recognized with your name." Ron was unable to attend and sent his regrets. His letter was presented on a special plaque.



Pete Cartwright, left and Lake County Supervisor Jim Comstock during the ceremony. Photo courtesy of Calpine

Executive Director of the Geothermal Education Office, Marilyn Nemzer praised Cartwright for his achievements and thanked him for creating the Visitor Center which "has given all of your geothermal colleagues a wonderful place to which we can refer people from everywhere." Nemzer also spoke on behalf of the Geothermal Resources Council, presenting an award and thanking Cartwright for his "tireless efforts in support of geothermal exploration, development and education."

Calpine President and CEO Jack Fusco said, "We are proud to honor a lifetime of dedication to clean, reliable power generation in California and across the United States." Peter Martin, of the Sierra Club Foundation, also offered congratulations during the ceremony.

That evening, Cartwright was presented with a Congressional Resolution authored by Congressman Mike Thompson, CA-Dist 1, who was unable to attend. Master of Ceremonies Joe Ronan, Calpine's Senior Vice President, Government and Regulatory Affairs, and a number of other organizations took the opportunity to honor Cartwright.

Lake County Supervisor Jim Comstock presented a resolution on behalf of the Board of Supervisors to Mike Rogers, Calpine's Senior Vice President, Geothermal Region, praising the Visitor Center and acknowledging Calpine's contributions to the County.

See Pete Cartwright's abbreviated bio on page 11.



President's Message

By Ron Suess

At a recent meeting of a particular university's "green team", we attempted to define the phrase, "sustainable energy". It proved elusive. Various definitions were offered but nobody was satisfied with any of them. We used the phrase repeatedly during the ensuing meeting, even though we recognized that the phrase was very vague as to its content and meaning.

The lack of a satisfying definition caused me to ponder whether or not The Geysers would fit within even a loose definition of sustainable energy. In the current energy milieu, there are perceptible benefits and liabilities attached to how a particular energy source is ultimately defined. How will this affect The Geysers, if at all?

We have developed the perspective that geothermal energy is renewable and, therefore, sustainable. That perception has been reinforced in numerous ways. The Renewable Portfolio Standard adopted by the state of California certainly creates the impression that geothermal energy is sustainable.

To check whether or not geothermal energy is sustainable (a nebulous definition notwithstanding), especially at The Geysers, here are some benchmark citations by which to measure:

A generally accepted definition of sustainable energy says, "...it is the provision of energy such that it meets the needs of the present without compromising the ability of future generations to meet their needs." A narrower interpretation includes only energy sources that are not expected to be depleted in a time frame relevant to the human race —*Renewable Energy and Efficiency Partnership (British)*.

Sustainable energy sources are most often regarded as including all renewable sources, such as solar power, wind power, wave power, and geothermal power. It usually also includes technologies that improve energy efficiency.

Energy efficiency and renewable energy are said to be the twin pillars of sustainable energy. In addition to the above definition, some other ways in which sustainable energy has been defined are:

"Sustainable Energy has two key components: renewable energy and energy efficiency."
—*Renewable Energy and Efficiency Partnership (British)*

"Dynamic harmony between equitable availability of energy-intensive goods and services to all people and the preservation of the earth for future generations." —*ibid.*

"Energy which is replenishable within a human lifetime and causes no long-term damage to the environment."

—*Jamaica Sustainable Development Network*

"Green energy is the term used to describe sources of energy that are considered to be environmentally friendly and non-polluting. Green energy sources are often considered "green" because they are perceived to lower carbon emissions and create less pollution."

—*TranACT*

"Green energy is often used interchangeably with the term renewable energy. Alternative energy and clean technologies are other terms often used instead of renewable energy. The terms suggest a non-polluting, non-fossil-fuel source. Green power is sometimes used in reference to electricity generated from "green" sources." —*US EPA (2008)*

With specific regard to geothermal energy at The Geysers, a reasonable and defensible case can be made to support that it is sustainable based upon the aforementioned citations. Let's see how geothermal energy at The Geysers fits within the above definition matrix:

It is generally recognized that the geothermal energy at The Geysers is environmentally friendly and essentially non-polluting (cf. Lake County Air Quality Attainment Status). Therefore, The Geysers qualifies as a "green energy" resource.

It is recognized that green energy and renewable energy are interchangeable terms meaning the same thing.

Sustainable energy sources include, by definition, renewable energy sources.

Geothermal energy at The Geysers is replenishable, and certainly within a human lifetime; moreover, it is causing no discernable long-term damage to the environment (ref. The Geysers Recharge Project).

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SHEL Committee Report

(Safety, Health, Environmental and Legislative Committee)

Nick Voegtly, Chair

The SHEL Committee met on May 19, 2010 at the Calpine Visitor Center.

Greenhouse Gas

A presentation by Barbara Lee, Northern Sonoma County Air Pollution Control Officer on Greenhouse Gases and The Geysers was postponed until the next meeting when pending action by the US EPA is expected to be completed.

Those present discussed Greenhouse Gas issues. A summary of consensus is:

- CARB personnel do not all currently have a good understanding of geothermal energy and are on a steep learning curve. The GGA and members have an opportunity to educate regulatory personnel that should be seized.
- Verification of greenhouse gas emissions is an economic burden for operators. There are questions about the benefits such verification will provide.
- Geothermal greenhouse gas emissions are negligible compared to combustion energy sources.
- State agencies such as CARB need to provide direction to local agencies on what significant emission levels are for greenhouse gases.

Diesel Engine Emissions

There are several different reporting schemes with redundancy on both mobile and stationary sources. Streamlining and coordination of these programs to reduce redundancy are needed. In addition to clarifying reporting for industry this would save the State of California money.

Induced Seismicity

Stanford University sponsored a forum earlier this year on induced seismicity related to geothermal energy and EGS. Information is available on the Stanford website.

Geysers Helipad Map

NCPA provided latitude / longitude coordinates and elevations for the NCPA Main Pad at A-Site next to

Plant 1 and for three auxiliary pads in Sonoma and one in Lake County.

Bottle Rock Power reported prior to the meeting that they are in the process of establishing helicopter pad sites and would like to have them on a revised map.

The NCPA site information will be provided to Mr. Kurt Seel, Calpine, who previously agreed to coordinate the map update.

New Business

Discussion of Committee and GGA education mission: Many local people are not aware that the world's largest geothermal field is in their counties. It is important to continue to educate the local population that The Geysers exists and serves the communities both by providing electricity and disposing of waste water.

Time and Date for next meeting:

Tentative: Tuesday, August 17, 2010, 10:00 a.m.
Calpine Cartwright Geothermal Visitors Center in Middletown.

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President's Message

Therefore, it can be concluded that geothermal energy at The Geysers is such that it meets the needs of the present without compromising the ability of future generations to meet their needs.

Whatever the debate may be with respect to defining what is meant by the phrase "sustainable energy", it is patently clear that the geothermal energy produced from The Geysers satisfies the definitions of green energy and renewable energy.

And, given the uniqueness of The Geysers Recharge Project, geothermal energy produced by The Geysers is sustainable in a very real manner. Thus, the effect of the definition of sustainable energy as applied to The Geysers, however nebulous, is positive.

We can legitimately view The Geysers as fitting nicely within the current energy milieu as a green-renewable and sustainable source of energy. Thus, defining The Geysers as a source of energy has benefited it and will continue to do so well into the future.

Geysers Geothermal Association

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Vice President/Finance Officer - Ralph Aviles
Secretary - Ben Barker

GGA Scholarship
WINNER
\$1,500

Fred Haley Memorial
Scholarship Award

Tara Puccioni

Ursuline High School
Santa Rosa



A competitive nature honed through years of sports is what drives Tara Puccioni to excel on the field and in the classroom. "I am a hard worker and use this competitive drive in all that I do," Tara wrote in the first paragraph of her Future Goals on the GGA scholarship form.

She added, "Not only do I assert myself in school, but also in extracurricular activities. I enjoy riding my ATV in the sand, and tuning it before a ride. It makes me feel special that I am good at this male dominated sport. That is why I have no reservations about being a female engineer."

Tara has her sights set on a Bachelor of Science degree in Mechanical Engineering, with plans to attend graduate school afterwards.

Following in her father's footsteps, Tara's plans include an internship at some point. "I look up to my dad for his success following the summer internship in 1985 that The Geysers offered him. I know how valuable internships can be in gaining actual experience and learning from fellow employees."

Tara's father, Mike Puccioni, applied for his internship with PG&E at The Geysers as a junior at Sacramento State College majoring in Mechanical Engineering. He commented that a friend of his father's, PG&E employee, Fred Haley who was then president of GGA, put in a good word for him, and he began his 24-year career at The Geysers shortly thereafter. He now works as director of project development at Calpine.

In addition to her love of sports and academics, Tara discovered her enthusiasm for volunteer work when she coached two Special Olympics basketball teams for her senior project.

She wrote, "Playing sports is my passion, but being able to inspire others and give them confidence on and off the court has been a life changing experience. In the future, it is my goal to always stay connected with Special Olympics and help give back to the

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GGA Scholarship
WINNER
\$1,500

Fred Haley Memorial
Scholarship Award

Zachary B. Mayer

Analy High School
Sebastopol



With an absolute commitment to, "one day help the people of Nepal in a manner which will benefit future generations," Zachary Mayer looks forward to college at University of Puget Sound in Tacoma, Washington, where he will participate in the Asian Study Abroad program to prepare him for his journey.

Zach did not choose this goal on a whim. He writes that he has had a lifelong fascination with Nepalese culture, and recently had an opportunity to visit there. He describes his journey as a life-changing experience, during which he embraced the Buddhist philosophy of compassion, love and kindness.

"Because the Nepalese do not have the same opportunities economically, socially or politically as Americans do, I feel it is imperative that I help to broaden their possibilities and improve their living conditions and quality of life," Zachary wrote in the Future Goals portion of his scholarship application.

Zach wrote that Puget Sound's International Political Economy Program, Asian Studies and Global Development Studies will prepare him to see the interdependency of the world through the study of international, social, economic and political issues.

"I feel the International Political Economy Program will permit me to better understand how individuals, communities, and nations are interconnected. It is my expectation that these academics will expand my unique interests, enabling me to be a more positive force."

A senior in high school, Zach has been involved in a variety of clubs and sports, including the Ultimate Frisbee Club, American Himalayan Foundation, Interact Club and both baseball and track teams. Zach was awarded the People to People nomination and has been honored for perfect attendance.

Outside high school Zach is involved in the Sebastopol Community Garden and worked at Garlock Christmas Tree Farm and Neighborhood Pet Services.

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Tara Puccioni

athletes that have taught me so much about trust, patience, confidence and organization.”

Tara’s counselor, Cyndi Niendorf, wrote that in the classroom, Tara has excellent time management skills and is extremely detail-oriented. “She has a quiet passion in everything she does. She is also dependable and responsible whether it is meeting deadlines, coordinating group projects or maintaining family relationships and friendships.

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Zachary Mayers

Zach has been fortunate in having opportunities to travel in Switzerland, Turkey, Italy, Greece, Bhutan, Thailand, England, and Nepal. He also attended a Spanish Immersion program in Spain.

In a letter of support, School Counselor Linda Ruderwrote praised Zach, saying he possesses an honest and humble character; and enjoys brightening the days of people he loves. “Zach is an optimist with a happy attitude; it is absolutely refreshing to interact with Zach.”

Zach’s mother is Peggy Mayer who works at ThermaSource, Inc. as Director of Financial Operations.

CanGEA Member Project Database now available

The Canadian Geothermal Energy Association (CanGEA) reported May 31 that their much anticipated CanGEA Member Projects Database, which outlines all of their member projects under development around the world, is now available to the public.

The database includes a *Geothermal Progress Checklist* to be used as a high-level guidance document. The checklist highlights the necessary steps in the development of a geothermal resource from exploration to production. Applying this framework allows for universal comparison among projects under development while providing the cursory framework for adherence to the *Geothermal Code for Public Reporting*. www.cangea.ca.



Power plant tours were a big attraction, giving folks a chance to peek inside the plants they’ve heard so much about.

Visitors flock to Calpine Earth Day celebration

Calpine’s annual community Earth Day event which took place Saturday, April 17 in Middletown was declared a huge success.

A total of 257 people participated in the power plant tours that Calpine offered throughout the day and many more participated in the day’s events. Over 75 booths were set up by groups, associations and vendors demonstrating at this event.

Habitat for Humanity, The Sierra Club, Master Gardeners, Lake County Air Quality Management were among the participants as well as many local vendors.

Festivities included original poetry recited by Russell Gonzaga, Lake County’s Poet Laureate, live musical and dance performances, demonstrations ranging from geothermal heat pumps and cooking with local produce to panning for gold. Presentations from Taylor Observatory and short films sponsored by EcoArts of Lake County were shown throughout the day in the indoor theater.

Calpine also kicked off its annual Earth Day Flyer artwork contest. This year’s winner was announced at the event’s opening ceremony by Dave Jackson, General Plant Manager, Area 2 — Orianna Maupin, age 8 and a student of Mr. Kennedy’s Class at Lake County International Charter School of Middletown. Jackson presented Orianna Maupin a \$25 gift certificate to Funtopia and presented her school with a \$150 donation from Calpine for their participation in the contest this year.

Many Geysers employees volunteered their time and effort to make this event a huge community success.



Participants enjoyed the day as NCPA celebrated the success of their 1 MW solar array at left.

Photos courtesy of NCPA



NCPA Dedicates Solar Array in special ceremony

Some 50 people were on hand at the Lake County Sanitation District's Middletown Treatment Plant on Highway 175 for the May 26 dedication of Northern California Power Agency (NCPA) 1 MW solar array. Located near the treatment plant, the array was completed in late 2009.

The NCPA dedication, coinciding with The Geysers 50-year festivities, celebrated 25 years of technological advancements that NCPA has pioneered over the years in their geothermal operations.

Green innovations

It was the success of NCPA's experimental pipeline utilizing treated wastewater to replenish The Geysers reservoirs that has made the steamfield sustainable—a model of green technology and community cooperation.

Utilizing solar energy to power the pumps that sustain the field that supplies energy to 60,000 homes in California has got to be the pinnacle of greenness, and a feat that NCPA can be proud of.

But NCPA didn't stop there. They went even greener, developing a down-hole turbine technology that is essentially a small hydroelectric generator.

As wastewater is injected back into the steamfield, the turbine generates additional electricity to power the plant's operations.

NCPA developed this novel technology in partnership with the State of California and the California Energy commission.

Yet another NCPA innovation is the use of near-horizontal drilling techniques borrowed from the oil and gas industry to improve the dispersion of injected wastewater.

Speakers praise ingenuity

Speakers paying tribute to NCPA included Dan Pellissier, deputy cabinet secretary for resources in Gov. Arnold Schwarzenegger's office; Brian Bottari from State Representative Mike Thompson's office; and representatives from the offices of state Senator Patricia Wiggins and Assembly member

Noreen Evans, as well as District 1 Supervisor Jim Comstock.

Comstock praised the geothermal industry's role in providing jobs and economic support for Lake County. He recognized Lake County Sanitation District Administrator Mark Dellenger for his work on the renewable energy projects.

NCPA was founded in 1968 as a forum through which community-owned utilities could safely navigate the utility market, and make investments that would ensure an affordable, reliable and clean supply of energy for its customers.

In 1983 NCPA entered the geothermal arena, and for the past 25 years has operated two power plants at The Geysers, each with a rated capacity of 110 MW.

To that end, all these years later, the dedication of NCPA's solar energy system is testament to the agency's ingenuity and its steadfast commitment to its customers and the environment.

Business Notes

■ Ram Power Corporation and Sierra Geothermal Power Corp. announced on May 31 that they have entered into a non-binding letter of intent in relation to the potential acquisition by Ram Power of all the outstanding common shares of Sierra.
www.ram-power.com

■ Richmond-based GeothermEx, Inc. was acquired this past April by technology giant, Schlumberger. GeothermEx is now operating as an integrated part of Schlumberger Geothermal Services, covering the full spectrum of resource exploration, development and production services. James Lovekin, VP Field Operations of GeothermEx, said that at this time location and contact information for the company remain the same.

Established in 1973, GeothermEx has developed numerous pioneering techniques for optimizing geothermal resources. Serving hundreds of geothermal power projects in more than 50 countries, GeothermEx specializes in geosciences, drilling, engineering, project development, reservoir management and economic analysis.

Schlumberger is the world's leading supplier of technology, integrated project management and information solutions to the oil and gas industry worldwide. They employ approximately 78,000 people representing over 140 nationalities in some 80 countries.

■ GGA member Carlenzoli Associates, a Civil Engineering and Surveying firm in Santa Rosa CA, merged last Fall with BKF Engineers, headquartered in Redwood City, Carlenzoli Associates was founded in 1986 and provides consulting services to North Bay public agencies, developers, and corporate clients. The 17-person firm will continue operations at 325 Tesconi Circle in Santa Rosa. Greg Hurd, former VP at Carlenzoli Associates, has become a Principal and Vice President with BKF Engineers. Hurd will be the Principal-in-Charge of the Santa Rosa office, which will continue operations as BKF/Carlenzoli. BKF Engineers is a leading engineering firm in California with 8 offices in the State including Redwood City, San Jose, Walnut Creek, Pleasanton, Sacramento, Richmond, Orange County, and now Santa Rosa. In 2009 BKF was ranked as the Largest Engineering firm in Silicon Valley by the Silicon Valley Business Journal, and the 7th Largest Firm in the Bay Area by the San Francisco Business Times.

People Notes

■ **Murray Grande**, geothermal facilities manager for NCPA for the past ten years was promoted last January to a new post as director of renewable resources development. As such he is charged with locating 350 MW of additional renewable power projects with an emphasis on geothermal. **Kevin Cunningham**, with years of Geysers experience through work with PG&E and Calpine, has taken Grande's place.

■ **Gerald ("Jerry") Hamblin** was recently hired by ThermaSource, Inc. in Santa Rosa as Chief Operating Officer. Hamblin comes to ThermaSource with over 33 years of experience in the geothermal industry in areas such as planning, well design, program evaluation, rig management and engineering.

Hamblin spent 30 years of his career at Unocal where he oversaw engineering and the drilling operations in parts of the US, Indonesia, and the Philippines. He has also managed projects for Philippine Geothermal, Inc., Ormat, Sierra Geothermal Power, CalEnergy, Calpine, NCPA and was the Drilling Manager for The Geysers and Salton Sea Fields. In addition to his experience in the field, Hamblin holds two patents that have helped advance the geothermal drilling industry. He was also a member of teams that planned the expansion of the Awibangkok field and the exploration of the Sarulla project in Indonesia. Hamblin attended Stanford University.

■ GGA member **Marilyn Nemzer** is the developer and editor of *Energy for Keeps: Creating Clean Electricity from Renewable Resources*, an award-winning book that has just printed an Expanded Third Edition.

Marilyn is director of the Geothermal Education Office and the Energy Education Group and has been producing award-winning energy education projects and materials since 1990. She serves on several state and national advisory boards that focus on energy and the environment, and is a trustee of the Marin County Board of Education.

The book's technical editor is another longtime GGA member, **Anna Carter**, Geothermal Support Services.

Energy for Keeps successfully explains each of the renewable energies in a way that is easily understood by readers of all ages. It includes biomass, geothermal, hydro, ocean, solar and wind, and speaks with clear language and engaging illustrations. It is available at www.energyforkeeps.org.

GGE harnesses local expertise for global steam projects

GeoGlobal Energy (GGE), a privately-held geothermal investment and development firm based in Maryland but with ties to Sonoma County, is fast becoming a major entity on the global geothermal scene. Formed in 2007, the firm is staffed with a team of geothermal experts (many from The Geysers), and has expectations of developing some 500 to 1,000 megawatts of geothermal capacity in select markets around the world. In addition to Corporate headquarters in the east, GGE has a technical office in Santa Rosa and two international field offices—one in Santiago, Chile and another in Munich, Germany.



Groundbreaking at the Tolhuaca project in Chile

Source: GGE website

Local Ties

GGE was co-founded by Greg Raasch former Unocal employee, and Michael Van Vleck, who met Raasch while contracting with Unocal in the 1990's. The firm's hand-picked senior management includes former Unocal geologist David Sussman; Sarah Slusser; Rüdiger Trenkle and Dr. Markus Wiendieck. Their Technical Team includes long-time GGA member, Paula Blaydes, principal Blaydes & Associates; Terry Kelley and Glenn Melosh, both formerly with Unocal; and Michael Moore.

Partners

MRP: In 2004, when Dr. Doug Heffernan, chief executive of State-owned Mighty River Power (MRP) in New Zealand, first conceived of expanding MRP's geothermal expertise to include developing and backing an international geothermal program, he set out to assemble a geothermal dream team. He found Greg Raasch in Chile where he was working on a project. Raasch, regarded as one of the top 10 in the world of geothermal development, helped Heffernan pull together the first 50 people for his team. As things

solidified, Raasch and Van Vleck built GGE into a reality and the partnership with MRP emerged with a commitment of \$250 million to GGE for development and acquisition of geothermal resources globally. MRP is one of the 10 biggest geothermal companies in the world.

EnergySource: Headquartered in San Diego, Energy Source is a developer, constructor, operator and owner of utility scale renewable energy projects, focusing on geothermal. They have a full office in El Centro. In addition to GGE, Energy Source is in partnership with Catalyst Renewables, a renewable energy developer based in Dallas, Texas, and Hannon Armstrong, an infrastructure finance firm based in Annapolis, Maryland.

Current Projects

Hudson Ranch: GGE announced May 20 that it has become the largest investor in the first stand-alone, high temperature flash technology geothermal power project to be developed in 20 years in the Imperial Valley, CA, one of the hottest and largest geothermal resources in the world. The \$400 million project will produce 49 MW of baseload power after its expected completion in two years. GGE is investing \$90 million in this project while also becoming a 20 percent investor in EnergySource. The Hudson Ranch project will create 200 full-time equivalent construction jobs. When completed, it will employ 35 full-time plant operations workers.

Chile: GGE Chile SpA was formed in August 2008 as a subsidiary of GeoGlobal Energy LLC and serves as GGE's platform in Chile. In January 2009, GGE Chile acquired a concession at Tolhuaca volcano, and in early 2009 drilled a successful exploration well, demonstrating at least 75 MW of resource potential. This represents the first high quality geothermal resource discovery in Chile since the discovery of El Tatio in the late 1960s.

Through a competitive bidding process, GGE Chile has acquired a 15,000 acre concession at Puchuldiza, believed to be at least of similar size and quality to the Tolhuaca resource. Exploration is currently underway to prove the Puchuldiza resource.

In addition to the two high quality geothermal concessions at Tolhuaca and Puchuldiza, GGE Chile has applied for several other prospective geothermal areas in a partnership with Colbún, S.A., a large, successful and established leader in the Chilean power sector.

Source: www.geogloballlc.com and various online sites

Points of Interest

■ In the April 2010 Geothermal Energy Association Industry report, Daniel Jennejohn, GEA Research Associate, noted that despite the recession, in 2009 geothermal energy employers added 750 full-time jobs and 2,827 construction-related jobs. His report also suggested that as 2010 unfolds, the number of states producing geothermal power will reach double digits. www.renewableenergyworld.com.

■ The California Public Utilities Commission approved a contract in early May for Southern California Edison to purchase geothermal energy from a planned facility in Imperial County jointly operated by Ram Power, Inc. and Orita Geothermal LLC.

SCE and California's two other investor-owned utilities, San Diego Gas & Electric and Pacific Gas & Electric are racing to fulfill a state mandate to obtain 20 percent of their power from renewable resources by the end of this year. Edison was ahead at the close of 2009 with 17.4 percent of its portfolio coming from renewables.

■ More land leases and streamlined permitting are cause for excitement for steam developers as the BLM auctions off a new round of land leases in southwestern United States. For more information go to www.renewableenergyworld.com and search 'southwestern prepares geothermal energy'.

■ Vulcan Power Company ("Vulcan"), a developer of geothermal energy projects, announced in April that drilling has recommenced at the company's Patua project site near Fernley, Nevada. They earlier announced that they had received a second equity investment of \$108 million from Denham Capital.

Vulcan's integrated drilling, geo-science, cementing, coring, engineering and construction teams will work over the next 24 months to complete Phase I of Patua, which is expected to be the company's first geothermal power plant, capable of producing 60 megawatts (MW) of clean energy. They are presently securing permitting and transmission right-of-way for the project. For more information go to www.vulcanpower.com/html/news

■ Oregon Institute of Technology's Klamath Falls campus dedicated its new geothermal electric project April 20. The power plant is the first geothermal combined heat and power plant in Oregon, and the only geothermal electric plant currently operating in the state. It has a maximum capacity output of 280 kilowatts gross power. Well work was done by Santa Rosa-based ThermaSource. For more information Google: oregon's first geothermal power plant.

AltaRock Energy announces EGS project in Newberry, Oregon

AltaRock Energy's mission to demonstrate the viability of enhanced geothermal system (EGS) technology may come to fruition next Fall in Oregon, where the firm has secured a federal lease outside the Newberry National Volcanic Monument about 30 miles south of Bend.

AltaRock Energy, headquartered in Sausalito with a technical office in Seattle, Washington, is a renewable energy development company focused on the research and development of EGS technology. They have partnered with Davenport Newberry, LLC, a company specializing in development and management of geothermal opportunities.

AltaRock's efforts to drill a 12,000-foot hole on a Northern California Power Agency (NCPA) leasehold last September were stymied when drillers encountered unstable conditions at approximately 4,400 feet, according to Susan Petty, president/chief technology officer and AltaRock founder.

Creating a model operation

EGS technology is an exciting and still unproven concept. AltaRock's plan for a successful outcome includes every possible consideration with regard to impact on surrounding communities, and the environment. "The Newberry project is subject to strict regulatory agency approval and will meet the requirements of the National Environmental Policy Act," said Will Osborn, project manager for AltaRock Energy.

The Davenport Newberry leases were designated for geothermal use by a committee that included representatives from the community, environmental groups, government and the geothermal industry.

The U.S. Bureau of Land Management, U.S. Forest, U.S. Department of Energy and Oregon State officials will review all plans and issue applicable permits only when satisfied that the Newberry project complies with strict standards. These public-sector entities will also monitor all aspects of the project as it progresses.

Doug Perry, President at Davenport Newberry stated, "We see this project as a true public-private collaboration, and we welcome input from government officials and community members. We seek nothing less than an ongoing 360-degree conversation with all parties. In addition, we've studied the science, refined the technology, and listened attentively to the community."

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Wood Group Field Services
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 www.woodgroup.com
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DISTRIBUTORS

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 Lower Lake CA 95457
707 994-6535

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 • Tom Lampe
 Healdsburg CA 95448
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DRILLING SERVICES

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 • Tom Nelson
 Rio Vista CA 94571
707 374-6172

Quality Tong Service, Inc.
 • Bill Scheiber
 Rio Oso CA 95674
 Casing install, tubular insp.
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Team Casing
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 Marysville CA 95901
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 • Louis Capuano Jr.
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707 523-2960

Weatherford Int'l, Inc.
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 www.weatherford.com
707 374-6493

EQUIPMENT AND MATERIALS

A-1 Milmac, Inc.
 • Kevin Dunne
 S. San Francisco 94080
 Piping, joints, valves etc.
650 871-4343

AAAction Rents
 • Bob Santucci
 Windsor CA 95492
707 838-4373

EQUIPMENT AND MATERIALS

C-K Supply, Inc.
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 Lakeport CA 95453
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Hudson Mechanical
 • Blaine Hudson
 Redding CA 96049
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 • Wayne Jackson
 Middletown CA 95461
707 987-3660

Mahl Tek Inc.
 • Dan Mahl
 Mill Valley CA 94941
415 388-7494

Piedmont Lumber
 • Rick White
 Lakeport, CA 95453-5694
707 263-8400

NETWORKING

Geothermal Resources Council
 • Curt Robinson
 Davis CA 95616
530 758-2360

SPECIAL SERVICES

Action Sanitary, inc.
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707 994-5068

August Welding
 • Tony August
 Witter Springs CA 95493
 Portable welding
707 275-9632

SPECIAL SERVICES

Cinquini & Passarino Inc.
 • Tony Cinquini
 Santa Rosa CA 95401
 Land surveyors
707 542-6268

CLP Skilled Trade
 • Toby Karlitz
 Santa Rosa CA 95404
707 569-0200

Obie's Drill Pipe Service, Inc.
 • Obie Sanders
 Clearlake CA 95422
 Harbanding for geothermal
707 994-4730

TNG Energy Services
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 Bakersfield CA 93308
661 323-7031

Sierra Crane & Hoist, Inc.
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 Auburn CA 95603
916 663-3794

STEAM SUPPLIERS & POWER PLANT OPERATORS

Bottlerock Power Plant
 • Brian Harms
 Cobb CA 95426
 www.bottlerockpower.com
707 928-4578

Calpine Corporation
 • Mike Rogers
 Middletown CA 95461
707 431-6000

Northern California Power Agency
 • Murray Grande
 Middletown CA 95461
707 987-4033

Ram Power Corporation
 • Mike Long
 Healdsburg CA 95448
707 723-4455 Office
707 473-9618 Fax

Would you like to add your website to your business listing?
 Call or email Marilyn Sanborn, 530 472-6442 msanborn@frontiernet.net
 Do we have your contact information up to date? Let us know changes.

Calpine founder Peter Cartwright followed his vision of cleaner energy

As a young man, Peter Cartwright's developed a keen interest in energy. At Princeton University he participated in Matterhorn, an Atomic Energy Commission project, developing thermonuclear energy. Earning his BS degree in 1952, he completed his masters at Columbia University the following year.

After serving in the U.S. Navy Civil Engineer Corps, Cartwright joined General Electric's Nuclear Energy Division in 1960, where he helped build nuclear power plants in India, Japan, Taiwan, and Mexico. He was also active in designing and building geothermal power plants in Utah, Southern California and The Geysers.

Cartwright stayed with GE for 19 years before joining Gibbs and Hill, a New York-based engineering firm. There he established the company's western regional office, which provided engineering services primarily for power plants.

In 1984 Cartwright and four co-workers started their own business as a management services provider to independent power companies. Their name, Calpine, was derived from their location in California and the word, 'alpine' for the Swiss company, Electrowatt, that helped finance their start. Cartwright was the company's first CEO, serving in that role until his retirement in 2005.

Four years after founding Calpine, they took a giant leap by establishing a power-generation business within the company, and soon celebrated ownership of one megawatt of power. They made a pact to have 1000 megawatts by the year 2000, a goal that seemed like pie in the sky back then, but which they handily surpassed!

In addition to their natural gas power plants, Calpine purchased an interest in the Aidlin geothermal power plant in the summer of 1989, marking its entry into the geothermal market and greener energy.

Steam supplies had begun to decline around 1989, and Cartwright strategized that consolidating ownership of power plants was the only way to maximize efficiency which would greatly improve the resource.

In 1999 Calpine acquired Unocal's stake in the 14,000-acre steam field along with two PG&E plants, making Calpine one of the largest independent power systems in the United States. At last the field was united. In 2003 the Geysers Recharge Project, which began

construction by Unocal in 1998, came online, re-energizing the steam field.

Just as Calpine reached its zenith the California power crisis and Enron scandal happened. Electricity markets began to collapse, hitting merchant generators like Calpine with rising credit costs and declining prices for their electricity.

Cartwright took many measures to correct the turnabout, and they seemed to be working. However, towards the end of 2005 the situation worsened. There was talk of bankruptcy resulting in an abrupt shakedown which precipitated 75-year-old Cartwright's retirement in November. On December 20 Calpine filed bankruptcy.

Since that dark time a scaled down Calpine is rebounding in the new hot market for green energy. And, for the ninth year in a row won the California Department of Conservation award for safety and the environment, and for outstanding lease maintenance.

And as for Pete? He recently formed Avalon EcoPower, a company dedicated to developing, owning and operating renewable power projects backed by natural gas-fired power plants.

Not one to sit around, Pete also has been active in environmental affairs and currently serves on the board of directors for the Sierra Club Foundation, as chairman of Symphony Silicon Valley, and as a member of the Santa Clara Valley Ethics Group.
Source: Answers.com, Calpine website, Wikipedia and various online sites.

Continued from page 9

AltaRock Energy EGS project

Support for geothermal

Funded by a recent \$21.45 million American Reinvestment and Recovery Act grant through the DOE and \$22.36 million from the AltaRock-Davenport partnership, the project will also benefit from research efforts of faculty and students at the University of Oregon, University of Utah, Lawrence Berkeley National Laboratory, Texas A&M, Temple University and scientists from the U.S. Geological Survey.

For more information see www.altarockenergy.com

2010 slate of officers and Board members announced

The Geysers Geothermal Association's Board of Directors held their first meeting for 2010 March 9. An important agenda item for that meeting was the election of GGA officers for the current year with terms ending in March 2011.

The GGA Executive Committee acted as the nominating sub-committee and presented a slate of candidates for the three offices authorized by the GGA Bylaws.

The slate of candidates nominated by the sub-committee follows:

President:	Ron Suess
Secretary:	Ben Barker
Financial Officer:	Ralph Aviles

GGA bylaws require the Board of Directors (BOD) to consist of a minimum 15 members to a maximum 25 members. Currently, there are 18 members.

This list of appointees represents the current BOD. These Directors all serve three-year terms. However, reckoning from 2010, the current set of members serve for one, two and three year terms expiring in successive years.

Accordingly, after each person consented to serve, the Board appointed the following people to serve as Board members for a three-year term ending in March 2013:

Steve Burden	Marilyn Sanborn
Louis Capuano II	Doug Jung
Boyd Green	Ted Wilmsen

There are various sub-committees that assist The GGA in accomplishing its business. Without the people leading these committees, the fundamental tasks of the GGA would not be fulfilled. These people are listed below:

Editorial:	Marilyn Sanborn
Membership:	Marilyn Sanborn
Public Relations:	Sylvia Timmons
SHEL:	Nick Voegtly
Web Site:	Dorothy Beebee
Scholarship:	Louis Capuano III

The GGA expresses its deep appreciation to all of these people for their willingness to work on behalf of the GGA and their individual and collective commitment to support the GGA with their time and energy.



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