

# From the Salton Sea to Sacramento – On the Trail of a Geothermal Gold Rush in California

by Ian Crawford

It's not often that such a big opportunity for geothermal energy development comes along, especially here in the USA. There is a lot of talk these days of the tremendous prospect of additional development of the Salton Sea Known Geothermal Resource Area in Southern California. The GRC has been following developments in the Imperial Valley and in the capital of the Golden State, in Sacramento.

## A Geothermal *El Dorado* – The Imperial Valley



The GRC was a sponsor for this important conference  
PHOTO BY IAN CRAWFORD

The GRC attended the **Imperial Valley Renewable Energy Summit** in March. Held at a Native American casino resort in the southeastern corner of California, just 1.5 miles from the border with Mexico, the conference provides a useful showcase for the renewable energy industry in the Imperial Valley.

Imperial County likes to promote itself as the “**renewable energy capital of the world**” because of the wide range of alternative resources available, from extensive wind farms on the down-slope of the Laguna mountains to the vast solar arrays on the valley floor.

However, geothermal energy was the first renewable to arrive in this desert outpost, with the **first exploratory wells drilled in 1927** and the first electrical development of a water-dominated geothermal resource in 1979 at the **B.C.**

**McCabe geothermal power plant.** In 1981, Ormat successfully demonstrated binary technology in the valley and then in 1984 the **50 MWe Heber dual-flash power plant** went online.

In recent years much of the attention at the Imperial Valley Renewable Energy Summit was on the new kids on the block – the solar and wind energy industries dominated the discussion. But this year was different. **Geothermal energy was again the focus of attention.**

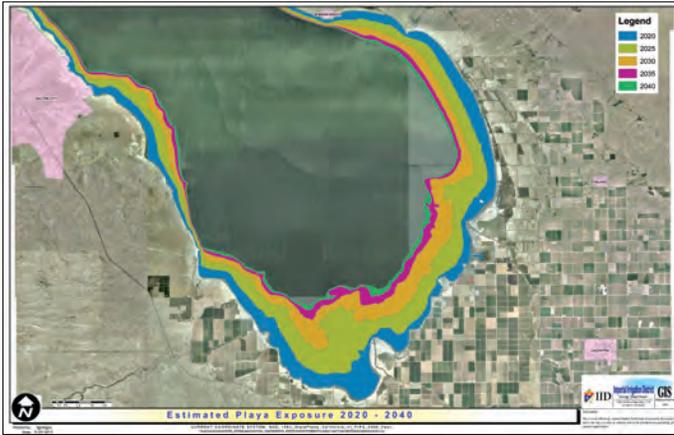
## Geothermal Energy to the Rescue of the Salton Sea

The most important topic at the conference was how to solve the problem of the shrinking Salton Sea, in the middle of the Imperial Valley.

For years, the local authorities have been looking for ways to **restore the Salton Sea to a more manageable condition.** The inland sea is a sink for the watershed, with no outlet and a dwindling supply of water. In a desert climate **the existing sea is shrinking, exposing extensive shoreline or playa.** The exposed dust is a potential air-borne pollutant. In addition, the rising salinity of the Salton Sea is threatening the fish and bird populations.

At the end of last year, the **Imperial Irrigation District (IID)** published the *Salton Sea Revenue Potential Study* which concluded that the newly exposed playa opens up possible development for geothermal energy which could help pay for restoration of the Salton Sea.

Coincidentally, most of the new land is owned by the IID and is over the **Salton Sea Known Geothermal Resource Area**, one of the most



Map showing how the surface area of the Salton Sea is estimated to shrink in the near future. COURTESY IMPERIAL IRRIGATION DISTRICT.

productive geothermal reservoirs in the world, currently generating about 500 MW.

**New development would add an additional 1,500 MW of energy** from the resource. *The Salton Sea Revenue Potential Study* estimates that this would **bring in \$2 billion over the next thirty years.**

The Salton Sea Initiative would use the revenue from the boom in geothermal energy development and associated industries to help pay for the restoration of the Salton Sea.

Speaker after speaker at the Renewable Energy Summit supported the initiative and legislation to give special treatment to geothermal energy in



The desolate shores of the shrinking Salton Sea. PHOTO BY IAN CRAWFORD.

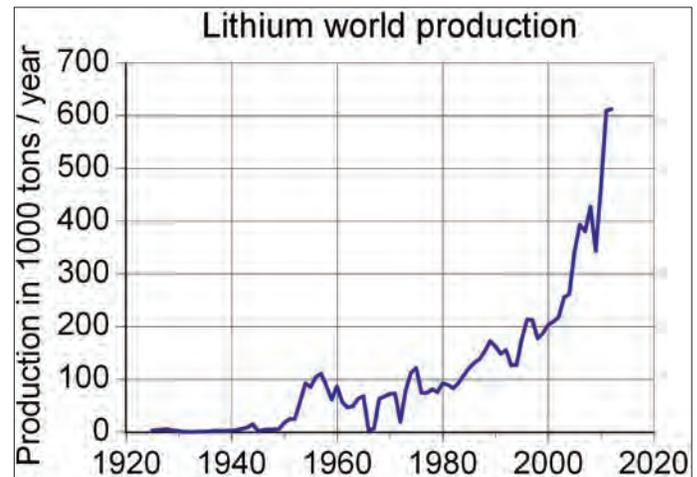
the valley. **Bob Sullivan**, vice president of **Ormat Technologies**, noted that several states already have solar carve-outs (additional legislative support for development). With an untapped geothermal potential estimated at more than 2,000 megawatts, **the Salton Sea is “the Saudi Arabia of geothermal,”** he said.

**Kevin Kelley**, General Manager for IID said “60,000 acres of exposed lake bed will result if nothing is done resulting in a **public health**

**nightmare.** There is a need for a smaller, more sustainable Salton Sea and **the development of geothermal energy is a solution.”**

**Carl Stills**, Energy Manager of IID stressed that new energy resources would require a new transmission line to the California coast and to other neighboring states. He described the **Strategic Transmission Expansion Plan (STEP)** that would provide a way to export renewable energy from the Imperial Valley north through the Coachella Valley to the populated coastal area. After the summit IID announced **it was in talks with a potential investor for a 500-kilovolt transmission line** from the Salton Sea.

**Randy Keller**, Director of Development, Transmission and Land Assets at **CalEnergy**, said because of the causticity of the geothermal brine, the developers of the Salton Sea Known Geothermal Resource Area would need to be experienced and proven. His company has projects ready to go.



There is increasing demand for lithium. COURTESY WIKIPEDIA COMMONS.

### Boom Times Ahead for Lithium?

In addition to the renewed interest in geothermal energy at the meeting, there was also talk of the **potential of the Lithium extraction industry** in the area, a potentially lucrative partnership opportunity for geothermal plant operators. *The Salton Sea Revenue Potential Study* estimates a **potential revenue from mineral recovery as about \$1.5 billion over the next 3 decades.**

On a bus tour of the renewable energy sites in the valley, a stop at the **Simbol Materials demonstration plant** showed great progress since I last visited. Located next door to the **John L. Featherstone geothermal power plant**, run by **EnergySource**, we saw much activity at the demonstration facility. **Dave Edwards**, Director

of Manufacturing at Simbol, described how they borrow brine from their geothermal power plant neighbors and extract 2% lithium carbonate that is further processed to make **Lithium-Ion**, an essential ingredient in car batteries. He said that they had completed over 9,000 hours of processing at the demonstration plant and that the company **plans to develop 10 processing plants** in the area in the future.

Simbol has already entered into a partnership with **Itochu**, a Japanese company with access to Asia's top electric vehicle battery manufacturers. However, the big fish would be the American electric car company, **Tesla Motors**.

The *Boston Globe* reported in March that Tesla had announced plans to open the **world's largest battery plant** in 2017. The goal is to overcome what it calls the biggest obstacle to meeting increased demand for its vehicles: a reliable supply of the advanced batteries that power them.

To accomplish that, **Tesla will need plenty of battery-grade lithium**. That is where Simbol Materials comes in.

Simbol is preparing to break ground on its own commercial plant in August, which would put it on track to start production at around the same time Tesla's plant is scheduled to open. At the time of writing **Tesla still has to decide where to build it's 'gigafactory'**. The Imperial Valley is lobbying hard to bring Tesla to a location next to the Salton

Sea where lithium will be in plentiful supply, provided by future geothermal energy development.



GRC Board Member Gene Suemnicht presented a Geothermal 101 Workshop to over 50 attendees at the Imperial Valley Renewable Energy Summit  
PHOTO IAN CRAWFORD

### On The Trail to Sacramento

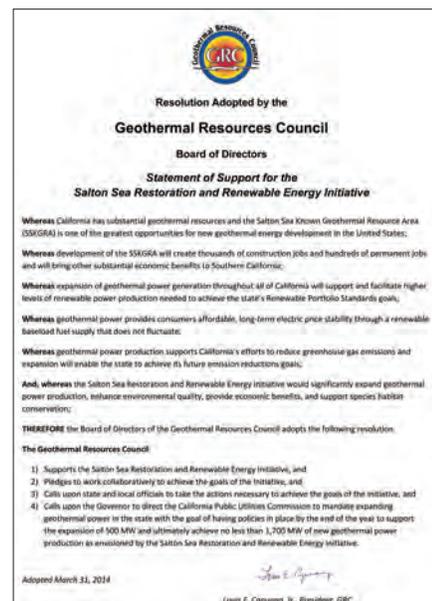
The GRC supports all efforts to develop the Salton Sea geothermal resources. We continued that support at a joint legislative hearing at the state capitol in Sacramento in April.

**Senator Ben Hueso, and Assemblyman V. Manuel Pérez**, led a discussion on the state's geothermal potential, particularly in the Salton Sea area.

**"Only 50 percent of the total identified geothermal power in California is being utilized. Why is that number so low?"** Senator Hueso said, starting off the discussion.

"Geothermal power is important to California's renewable portfolio standard (RPS) requirements. However, despite geothermal contributions to the grid, the use of this power source has been steadily decreasing over time. We need clear answers and a thorough understanding of how geothermal power can be used to advance renewable energy production in California," continued Senator Hueso.

GRC Executive Director, **Steve Ponder** was a key witness at the hearing and said "The Imperial Valley has the largest confirmed geothermal reservoirs in the USA. **These reserves are generally considered by geothermal experts to be between 1500 MW and 2500 MWs**. These estimates are orders of magnitude larger than any other geothermal potential reserves in known geothermal areas in the USA."



The resolution presented by Steve Ponder at the joint legislative hearing in Sacramento.

Steve also presented a **resolution from the GRC Board of Directors endorsing the Salton Sea Restoration and Renewable Energy Initiative**.

Again, most present at the meeting spoke in support of developing geothermal energy in the state and any legislation to advance the Salton Sea Restoration Initiative and associated geothermal power plant projects in the Imperial Valley.

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These are exciting times for geothermal energy in California. If everything goes to plan, production from the Salton Sea Known Geothermal Resource Area could quadruple in the next few decades and there could be an additional revenue stream from partnering with lithium production companies. **Lets hope for another 49'er gold rush, this time for geothermal energy.**



On the California Senate floor with Senator Noreen Evans (center). The Geysers geothermal energy developer Calpine organized a legislative day at the state Capitol in Sacramento on Cinco de Mayo to promote legislation supporting development of the geothermal energy industry in California. Individuals from Ormat, Terra-Gen, EnergySource, EGS Inc., Imperial Valley Economic Development Corporation, Imperial Irrigation District and the Geothermal Resources Council, met with legislators and were acknowledged on the floors of the two chambers. In the evening Calpine held a reception to celebrate geothermal energy, California's 'hot & steamy' renewable resource, with a cold margarita! ■

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