THE HISTORY OF GEOTHERMAL DEVELOPMENT IN HAWAII

In 1881 King Kalakaua and his attorney general William Armstrong met with Thomas Edison in New York. It was Armstrong who offered the idea of the volcano producing electricity and the possibility of laying electric wires as submarine cables between islands. Edison replies “It would cost so much, that’s all.” This remark was remarkably prophetic, given the fact that as of 1992, the state and federal government spent over $64 million dollars on a 500 megawatt inter island cable project.

After years of opposition and effective lawsuits challenging the environmental and economic viability of the 500 MW undersea cable to Oahu, geothermal drilling began in Puna in 1961 when Thermal Power drilled four shallow wells in the Kilauea Middle East Rift Zone. Geothermal development is planned for the Puna district of the Big Island in the Kilauea East Rift Zone. Considered one of the most active volcanic areas in the world, it is situated on a hot spot where a geothermal reservoir has been trapped in an area of faults and lava intrusions. Puna is the home of Pele, and native Hawaiian practitioners believe mining for steam is a desecration of her body.

Hawai'i is the only place in the world where geothermal plants deal with a hot spot (as opposed to tectonic plates creating heat) and therefore has the highest concentration of hydrogen sulfide, a highly lethal toxic residue that is released into air during geothermal production.

As of 2012, at least 25 geothermal wells were drilled on the Kilauea volcano in areas designated as subzones to facilitate development on agricultural and conservation lands. Five of them were funded by government agencies and legislative appropriations. The remainder were drilled by 6 different companies on land owned by the Estate of James Campbell and Kapoho Land and Development.

In 1973 the U.S. Department of Energy and the National Science Foundation assisted the state with grants to fund the HGP-A experimental well, the first geothermal plant in Puna. When HGP-A was drilled in 1976, the project was presented as a strictly experimental, two year demonstration project and not a production well. In 1982, despite commitments to the public, a three-megawatt power plant went on line. No community meetings were held explaining the change. The geothermal power plant continued for eight years and was shut down in 1989. HGP-A dumped the toxic geothermal brine into unlined ponds that fouled the air, land and water. Federal regulatory agencies deemed their effluent abatement systems unacceptable. For over ten years the well and power plant were operated without effective pollution abatement. Brine was disposed of in unlined ponds. Hydrogen sulfide and other pollutants were released into the community during well cleanouts and plant maintenance.

In the early 1980's Campbell Estate teamed up with True Oil Company to exploratory drill in the forest just east of Volcanoes National Park. A volcanic eruption forced a speedy land swap with the state to move the operation to Wao Kele o Puna, a protected natural area reserve. In 1993, True geothermal abandoned the project for financial reasons and turned it over to the state.

In 1989 the State began to drill four Scientific Observation Holes to define the extent of the resource. The program ended in 1991 when a judge halted federal funding until an Environmental Impact Statement was prepared. Two holes were completed by then.

Since the early 1980s Puna Geothermal Venture operates a well field and power plant adjacent to the HGP-A site. Although residential subdivisions and small farms surrounded the project, permits were issued by the State and County. Technological and managerial problems led to delays and accidents including well blowouts that affected neighbors over the years.

Intervention of the EPA in groundwater protection permits and a compliance investigation in 1995 resulted in numerous recommendations--many remain undone. According to the Emergency Planning and Community Right-to-Know Act (EPCRA), local emergency planing committees are required to develop emergency response plans to prepare for and respond to potential chemical accidents.

There was a major accident at PGV in 1991, when PGV had a well blow out that vented more than 2,200 pounds of hydrogen sulfide over a 31 hour period, killing animals and forcing the evacuation of at least 75 Puna Residents.

Based on a detailed review of emergency response capabilities at PGV in 1996, the EPA made numerous safety recommendations, including the development of a site specific evacuation plan. Sixteen years later, these recommendations have not been implemented, and we do not have an evacuation plan for the local community, even though our records show 18 declared civil defense emergencies at PGV between 1991 and 1999. We have not been able

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to obtain the records after that. We believe many more releases occurred.

Since then, PGV's parent company Ormat went to great lengths to insulate themselves from financial liability in the event of a catastrophic accident. This means in the event of a catastrophic accident or liability for toxic releases, PGV has no assets to garner, and Ormat is protected by LLC's.

PGV calls their system "closed loop," but they often release hydrogen sulfide into the air when they have problems at the plant. As recently as November 7, 2011 PGV was affected by a lightning strike which tripped the plant offline and caused hydrogen sulfide gas to be vented. PGV uses 42,000 gallons of highly flammable, toxic pentane. They lose an average of 40-100 gallons of Pentane a day into the environment.

PGV pumps 3,000 gallons per minute of toxic brine back into injection wells. If a pentane explosion, lava flow, earthquake or hurricane breaks their pipes, it would take minutes for the air, land and water to be irrevocably fouled. The geothermal brine contains hydrogen sulfide, lead, nickel, chromium, and mercury.

The passage of ACT 097 in 2012, stripped counties of land use control over geothermal development. The county no longer has authority over the granting of the Geothermal Resource Permit, which requires emergency plan development, to address noise levels and H2S emissions. Also with Act 097, geothermal subzones were eliminated. This means geothermal exploratory drilling and a power plant could be built almost anywhere in this state--including agricultural and rural districts. 50% of the people on Hawai'i live in or about agricultural and rural zoned areas.

Although Puna produces 20 percent of Big Island electricity requirements at PGV and another 10 percent at Shipman steam power plant in Kea'au, totaling 30 percent of Big Island power, Puna residents only use 6 percent of total power, in part because many Puna residents are off-grid, conserve, and produce their own power. Any additional power will not be used in Puna. Advocates say geothermal power will lower rates, but the Big Island has 20 percent geothermal power and higher rates than Maui and Oahu, which have no geothermal power.

During 2011, a total of $1.8 million in geothermal royalties was received from PGV by the state of Hawai'i. They in turn distributed 30 percent to the County of Hawai'i, totaling $568,000. Additionally, 20 percent, $378,000 was distributed to the Office of Hawaiian Affairs. If you follow the money trail, geothermal supporters have two things in common: they live more than 10 miles from the plant and they make money from geothermal plants.

Since geothermal began in the 70's in lower Puna, geothermal plants proved themselves to diminish the rights of natives to protect their deity Pele and are toxic to people, animals, plants, and the environment. Unfortunately, government and geothermal companies do little to protect public health and safety. To this day, we do not have extensive research of health problems associated with geothermal production, nor do we have an adequate number of gas monitors or an Emergency Response Plan.

And still, the State of Hawai'i, through Governor Abercrombie, Hawai'i County Mayor Billy Kenoi, together with privately owned utility monopoly, HEI/HELCO, and other private companies interested in doing geothermal business, such as Richard Ha of Ku'oko'a Inc., promote further and faster development of geothermal plants and the super-expensive inter-island cable. These old ideas were brought up in the 90's but rejected because of feasibility and expense. Now, laws have been quickly passed (Act 97 and Act 55) that would allow geothermal and any other industrial or other development to streamline the development process anywhere in the state, bypassing basic building, zoning, and other county laws, community input requirement, and Environmental Impact Statement on the drilling activities.

Continue educating yourself on the issues.

- Keep up to date with the news: Hawai'i Political Reporter, Big Island Video News and Civil Beat offer information not covered in the mainstream media.
- Sign up for our newsletters and updates by sending an email to **newsletter@punapono.com**
- Volunteer your time to help organizations like ours, Pele Defense Fund, Occupy Hawai'i and Sierra Club Hawai'i.
- To access various documents on the geothermal issue visit **www.punapono.com**
- Listen to people's testimonies on the geothermal on YouTube channel "Occupy Hawai'i"
- Donate to Puna Pono Alliance via credit card or PayPal at **punapono.com/contribute** or send a check or PO to Puna Pono Alliance, PO Box 492-668, Keaau, Hawaii, 96749.
- To help in other ways, please call (808) 339-4344.