

Geothermal Emergency Renovation Investment

Request: \$18 million to repair geothermal heating system

Oregon Tech's Campus is Heated ENTIRELY by Zero Emission Renewable Energy

Geothermal energy has been used since the 1960s to provide primary heating to the Klamath Falls campus and was the primary factor for locating the campus where it is today. Oregon Tech pumps hot water ($\approx 195^{\circ}\text{F}$) from below the earth's surface via multiple wells to a storage tank, where it then flows by gravity to various parts of the campus through both underground and tunnel-encased piping.

The geothermal water is used to provide heating for campus buildings, snow melting for sidewalks providing ADA pathways, and domestic hot water. The geothermal resource is the only source of heating for most of the campus.

Without Renovations the System will FAIL

Since these systems were built over 60 years ago the existing geothermal wells and delivery systems are aging and experiencing multiple repeated single points of failure affecting critical student services and facilities. The critical nature of the system's current condition is a genuine life-safety risk with severe, immediate implications for student and employee safety and to the university's daily operations.

A professional engineering firm performed a detailed geothermal infrastructure condition analysis in June 2022 and found \$14.9 million (\$17.9 million adjusted for inflation) in estimated repairs necessary to address immediate emergent and near-term life safety risks and to avoid imminent system failure, which would require campus closure.

Maintaining the System and Addressing the Deficiencies is Substantially Cheaper than Replacing the System with Electric or Gas

According to an engineering study conducted in 2022, repairing the system pays for itself over replacing the system with natural gas in only four years. The study indicated that switching to an alternate energy system (electric or gas) for the campus would be cost prohibitive compared to repairing and renovating the existing geothermal system.

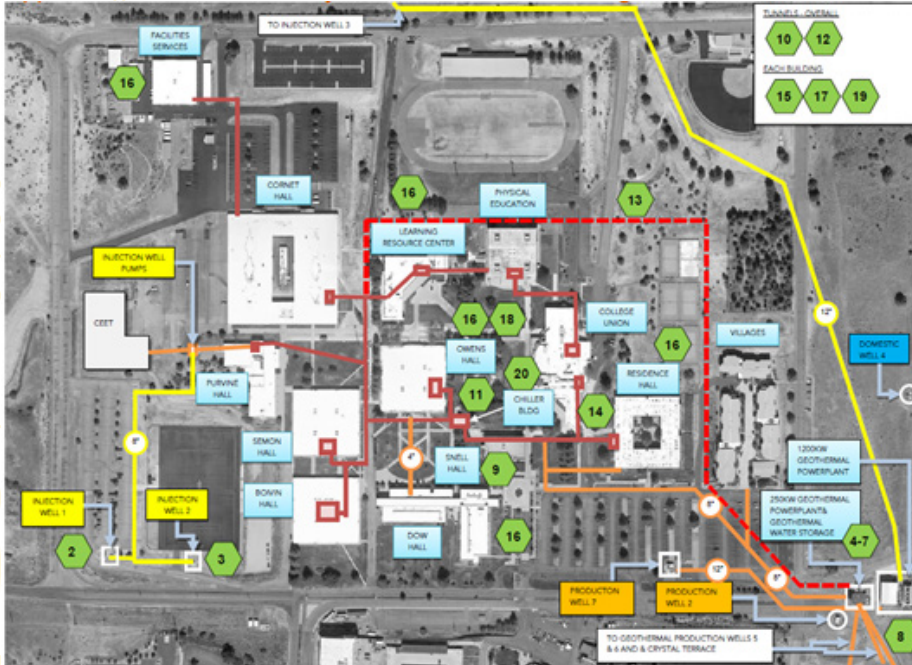
The geothermal system saves Oregon Tech over \$1.4 million in annual energy costs on the Klamath Falls campus. Oregon Tech estimates that the return on investment of the emergency renovation over the next 20 years is approximately 80.1% (operational savings up to \$14.6 million), with the emergency renovation more than paying for itself within the first 30 years. The emergency renovation will allow Oregon Tech to continue to heat the Klamath Falls campus through this renewable resource for the next 60 years.

System Failure will Displace Students and Require a Complete Campus Closure

The consequences of a system failure are no heat or hot water on campus in a community that experiences below freezing temperatures 7 months out of the year, building flooding, and power disruptions. Personnel will also experience life safety risks due to the high temperature and confined space.

Renovating the System Will Provide Another 60 Years of Renewable Energy

It is important to note that over the years, Oregon Tech has consistently invested in maintaining its extensive geothermal infrastructure through a combination of CIR and other university funds. It is only now after six decades of continuous use that failure points are beginning to escalate due to the overall age of the entire system. Efficiencies from this renewable resource were not accrued in a reserve, but as with other achieved operational efficiencies allowed Oregon Tech to invest more in academic programs and student support services.



Map of current geothermal system on Klamath Falls campus.



Sept. 2022: Corroded and failed building heat exchanger unit causing temporary building closure.



Spring 2022: Corroded and compromised Well #1.



June 2022: Ruptured main line causing temporary campus closure.

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